Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
9471	0	0	0	0	to add new references - J. Resour. Ecol. 2018 9(3) 257-265 DOI: 10.5814/j.issn.1674-764x.2018.03.005 www.jorae.cn Combating Desertification and Improving Local Livelihoods through the GGWI in the Sahel Region: the Example of Senegal 2 - To move into the solutions space as well as practical actions as far AFOLU is concerned (considering further aspects related to ethics and equity with the risks to further impoverish many more people located e.g. in Africa's and Latin America's); this chapter should clearly and upfront tackle the essential issue of carbon footprints reduction as well as the financing of adaptation and mitigation to further limit global warming impacts hence stimulate innovation and demand for "green technologies as well as blue economy particularly at the Land/Sea Interface"; This should be a prerequisite if we are serious about tackling issues of negative impacts on biodiversity. This needs to be debated now if one would like to avoid severe degradation with larger losses of resources in the very near future	Accept, we will consider the reference. Agree that side effects of mitigation were not dealt with sufficiently in FOD . trade effects of the issue of carbon footprints reduction will be dealt with as well as the financing of adaptation and mitigation	Salif DIOP	National Sciences & Techniques Academy of Senegal	Senegal
9479	0	0	0	0	One issue to insist upon is the need for such chapter to use integrative approach to biogeochemistry, ecology and sociology that will provide a better understanding of the impacts of global environmental change, demographic change and globalization on such related AFOLU chapter, including interaction between soil biogeochemistry and plants; plants and water cycle; water cycle and soil biogeochemistry, all around the atmosphere. Another issue to highlight - the abrupt structural/functional changes of ecosystems called regime shifts, for example, grasslands to desert, or grassland to shrubland that can be triggered by multiple external drivers?	accept, additional CA for biogeochemistry and biophysics was taken on board and will be dealt with	Salif DIOP	National Sciences & Techniques Academy of Senegal	Senegal
9481	0	0	0	0	Another major challenge that needs to be emphazised with livestock, with the accentuation of the variability of climatic phenomena, which negatively impacts ecosystems and livelihoods of local populations. in particular how those are represented with regard to the water crisis; Hence the need for social vulnerability approaches and methodologies that include means of defining social vulnerability of populations and the rules governing local configurations within global environmental and climate change. Also is lacking in-depth analysis of issues of land tenure security for integrated sustainable land management,	accept, we will enhance on social issues and land tenure	Salif DIOP	National Sciences & Techniques Academy of Senegal	Senegal
10007	0	0	0	0	The name of the contributing author is Vassilis Daioglou, not Diaoglou.	accept	Haris Doukas	School of Electrical and Computer Engineering, National Technical University of Athens	Greece
12185	0	0	0	0	This chapter covers AFOLU sector, emphasising forestry system more than agriculture that deserves additional information to include such as (i) standard methodological approaches to measure monitor and accounting GHGs, (ii) sceintific and technological options for mitigation, and (ii) development of appropriate policies and their implementation at national level for upscaling to global level. Poor construction of sentences, duplication of information and use of same words in a paragraph can be been in some subsections. Tables sourced from other publication(s) are not acknowldged. Some rereferences cited in the body of the text are not listed. When the acronym used for the first time must be spell out throughout including in Executive Symmary. Need to make clear the definitions of trade-off vs. offset. Use of variable units should be avoided. Further improvement is suggested.	accept, many shortcomings were seen by reviewer. SOD will deal with them	Mohammad Ibrahim Khalil	University College Dublin	Ireland
16813	0	0	0	0	NA	unclear.	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
20003	0	0	0	0	Figures in general don't have a high enough resolution and often contain too small text	accept, figures will be improved	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
20005	0	0	0	0	"refs": reference are missing at places throughout the text	accept, refs will be completed	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
20017	0	0	0	0	metrics: make sure space is place where needed	unclear.	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
20045	0	0	0	0	In general, thoughout the chapter, I feel that information on agriculture is very limited comapred to forestry and land use.	accept, we will balance better between forestry and agriculture	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
20057	0	0	0	0	The chapter has many well written parts with plenty of references to published materials (e.g. Measures in food systems), but other parts have much lower level of information density, the summaries of papers are not contextualised well and not linked to each other, the regional aspects are not presented, the flow of the text is a bit clumsy at places, and there are many small editorial problems. A thorought eidting and some effort in adding information to "lighter" sections should help.	accept, a thorough rewrite will take place	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
25735	0	0	0	0	Throughout the chapter there are many sentences that are very long and/or rambling. They should be made more concise or split into shorter sentences, e.g. p3 line 7-10, p33 line 38-42, p63 line 19, p69 line 13	accept, a thorough rewrite will take place	Helen Hughes	University of Edinburgh	United Kingdom (of Great Britain and Northern Ireland)
25737	0	0	0	0	Use of acronyms needs thought: in particular, consider not introducing acronyms that will only be used in a short sub-section (e.g. p101 line 8)	accept, a thorough rewrite will take place	Helen Hughes	University of Edinburgh	United Kingdom (of Great Britain and Northern Ireland)

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
25739	0	0	0	0	Soil carbon sequestration: it is important to consider depth and bulk density when collating and comparing data. The best basis for comparison might be the whole soil profile, but many measurements consider only the top layer and do not necessarily consider difference/change in bulk density, which can impact the SOC estimates across a given area. Suggest that SOC data quoted should always be accompanied by the depth interval it refers to and that consideration is needed when comparing results from across papers or systems within one paragraph. (Tables 7.5/7.6, section beginning p49 line 42)	accept, we will reorganise section 7.5. the soil C parts will be changed thoroughly	Helen Hughes	University of Edinburgh	United Kingdom (of Great Britain and Northern Ireland)
28939	0	0	0	0	Please read each paragraph more carefully, there are a lot of reference that haven't include the reference's year	accept, a thorough rewrite will take place	Marissa Malahayati	National Institute for Environmental Studies	Japan
28961	0	0	0	0	This is just my opinion. I reviewed the WGII (adaptation) document and it was a cross-chapter about tropical forest and adaptation for AFOLU too. Somehow, there are many part that I can found both in the adaptatio for AFOLU and tropical forest, and this AFOLU mitigation chapter (e.g. the driver of deforestation). Would you mind to at least inform in the beginning of the chapter, what is the difference and cross-cutting issues between this document and the adaptation document? Maybe not all people read those two documents. But for me, it is like "de javu" in some parts. Maybe you need to read the adaptation document too.	accept, we have established stronger links with WGII now. our drivers section can be shortened	Marissa Malahayati	National Institute for Environmental Studies	Japan
29025	0	0	0	0	I often found some figure are attached, but the passage doesn't mention the figures. Please re-check it	accept, a thorough rewrite will take place	Marissa Malahayati	National Institute for Environmental Studies	Japan
29027	0	0	0	0	Some figures captions are too long. If you need to explain more about the figure, kindly put some passage about it not on the figure captions	taken into account. sometimes this is possible, sometimes not	Marissa Malahayati	National Institute for Environmental Studies	Japan
29031	0	0	0	0	Similar like other chapter, I think you need more examples and case related to the developing countries. It is quite strange talking about the LUCF without talking much about developing countries.	accept, we will balance better, and have more regional information	Marissa Malahayati	National Institute for Environmental Studies	Japan
30593	0	0	0	0	Although this chapter discusses the effects of food consumption (concentrating on meat) on land use change, and the importance of reducing mangrove deforestation separately, there is no discussion of shrimp and prawn consumption as a driver of mangrove deforestation. It would be worth expanding the dicussions of dietary shifts throughout (especially section 7.5.9) to reduce meat consumption to include other GHG-intensive (and deforestation-related) foods such as farmed crustaceans. For example: Boone Kauffman et al. (2017). The jumbo carbon footprint of a shrimp: carbon losses from mangrove deforestation. Frontiers in Ecology and the Environment, 15(4), 183-188.	accept, we will improve the coastal sections. Boone kaufmann becomes a CA	Raychel Santo	Johns Hopkins Center for a Livable Future, Bloomberg School of Public Health	United States of America
44971	0	0	0	0	As a result of the growing interest of companies and economic sectors that propose the use of forestry projects as a way to achieve carbon neutrality, it must be emphasized that the afolu sector is not a free ride to offset the emissions of any other sector prioritizing its role in relation to inevitable emissions	noted, we literally have this in exe sum	Jorge Pina	ENEL	Spain
44973	0	0	0	0	Green energy -emission-free- is often equated with compensated energy, ultimately resulting in a misleading message. As an example of what we are trying to explain, the aviation sector offers the possibility of offsetting the emissions associated with a displacement, for which in most cases forest credits are used. However, for certain distances, the same journey by electric train has a greater impact in terms of climate change.	noted, a multi sectoral aspect of ch 12.	Jorge Pina	ENEL	Spain
20149	0		0		It is important to notice that bioenergy and BECCS are treated much more favorably in this chapter than in SRCCL. WG2 of AR6 is also showing considerable tradeoffs between land-based mitigation via bioenergy generation and food security. While I think that there are more grey zones and opportunities for land-based mitigation than SRCCL suggests, it is important to go beyond that report by showing how nature-based solutions can contribute to mitigation without enhancing food insecurity and leading to widespread conversion of natural forests and rangelands into biomass plantations. Beyond a short section on SDGs, which is entirely borrowed from IPBES and seems to be saying the exact opposite of what the models demand for land-based mitigation, this chapter does not go into any level of detail to describe the tradeoffs and costs to provisioning and regulating ecosystem services lost due to the large-scale investment in biomass energy. I find this very concerning and believe that we must avoid telling different stories across the different working groups of AR6.	accept, a thorough rewrite will take place as well as the actual assessment	Henry Neufeldt	UNEP DTU Partnership	Denmark
13875	0	0			An opportunity exists to include Indigenous land management, restoration and environmental stewardship practices and laws as an example of place-based mitigation and adaptation.	accept, indigenous people's rights will be reflected better	Bridget Doyle	Tsleil-Waututh Nation	Canada
16499	0	0			In reference list, to avoid confusion and easy to find, add all authors names for the references instead of just et. al. (e.g. Smith et. al., 2013, 2014, 2016, 2019)	editorial	Mostafa Jafari	Head of TPS for LFCCs/ and IPCC LA	Iran
16501	0	0			Low forest cover countries (LFCCs) and their potential for plantation and their role on mitigation are totally neglected.	accept, we will balance better for regions.	Mostafa Jafari	Head of TPS for LFCCs/ and IPCC LA	Iran
584	0				Please make sure that all acronyms are properly defined at first use	accept	Pierre Bernier	Natural Resources Canada	Canada
586	0				Please make sure that only one unit of CO2 stocks and one unit of CO2 flux are used throughout the chapter	accept, to be implemented	Pierre Bernier	Natural Resources Canada	Canada
594	0				many reference in the text missing from the reference list	editorial	Pierre Bernier	Natural Resources Canada	Canada

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
2269	0				Why is enhanced weathering not considered in this assessment? This land-based CDR technique can be applied in agriculture, where it may provide several co-benefits, but more research is required especially to collect empirical data on the potential and feasibility of this technique. See e.g. https://www.nature.com/articles/s41477-018-0108-y; https://iopscience.iop.org/article/10.1088/1748-9326/aaa9c4. I think that this technique should at least be mentioned, and it could also be listed with the knowledge gaps.	accept, will be taken on novel techniques	Sara Vicca	University of Antwerp	Belgium
8555	0				Most figures (and also Tables) are not of publishable quality. For example, many figures look drawn by Excel and not carefully prepared.	editorial	Shoji Hashimoto	Forestry and Forest Products Research Institute / The University of Tokyo	Japan
8559	0				Perennial crops such as tea, rubber, fruits were known as carbon sink or contributor of carbon sequestration. So, perennial crops as one of mitigation measures should be included in 7.5. Reference: Estimating carbon fixation in fruit crops(Ana pérez et al.2020), Carbon sequestration potential of perennial horticultural crops in Indian Tropics(Ganeshamurthy et al. 2019), Carbon sequestration potential of mango orchards in India(Ganeshamurthy et al. 2019)	accept, agroforestry is a measure in 7.5.	Eun Jung Choi	National institute of agricultural sciences	Republic of Korea
8561	0				There should be no space between number and celsius degree.	editorial	Eun Jung Choi	National institute of agricultural sciences	Republic of Korea
10377	0				The chapter has a long way to go and is not in a shape expected of a first order draft. The key issue in my view is that insufficient work has been done to comprehensively assess the available and relevant literature and to develop robust and relevant conclusions. Many individual sections provide a light-handed literature review but fail to provide an assessment, i.e. clear conclusions with regard to policy-relevant questions that those sections could and should have addressed. In addition, the wording is often policy prescriptive and/or ambiguous/qualitative/value-laden without appropriate references. The separation and added value of this chapter compared to SRCCL remains unclear and many sections seem to cover similar ground without clearly demonstrating that, where and why they go beyond SRCCL; I also don't feel that the structure of the chapter delivers on its stated goal (the chapter says (page 6) that it assesses policy response options but has no section on policy response options?). These issues are understandable given the multiple workloads for some authors, but they mean a fundamental discussion is needed by the authors on how to essentially leap-frog this draft into a second-order draft by having a clear sense of what questions the chapter and specific sections need to address and provide assessment conclusions on.	accept, a thorough rewrite will take place	Andy Reisinger	NZAGRC	New Zealand
10381	0				The chapter attempts to provide uncertainty/confidence language in the executive summary, but it doesn't do this in the body of the chapter. It is critical that the chapter demonstrates, in concluding each section, what conclusions it reaches and why, and why it ends up with a specific confidence level. I.e. demonstrate and justify your conclusions within the text - otherwise there is a large gap between the body of the chapter and its executive summary, where the assessment falls out of the sky. Make sure the assessment is done organically within the chapter, concluding each major section/issue.	accept, a thorough rewrite will take place	Andy Reisinger	NZAGRC	New Zealand
10395	0				My expectation was that this chapter would clarify how much biomass can be produced for bioenergy and other uses, and under what assumptions specific biomass production scenarios pose a risk to food security based on their land demand, as an input and boundary condition for other chapters (3, 6, 12) - but I can't really find this information or even know where to look for it in the current chapter structure.	partly agree, the bioenergy section provides part of that answer in EJ	Andy Reisinger	NZAGRC	New Zealand
10399	0				Given the extensive coverage of issues addressed in this chapter in both the SR15 and SRCCL, as well as the preceding AR5, I don't think it makes sense to have a single short section (7.1.1) on "findings from previous reports". You can have a section that summarises the scope of those reports, but I would urge the authors to consider drawing much more extensively and comprehensively on the previous reports at the beginning of each key substantive section - and then make an assessment whether more recent literature has changed the previous assessments in any way, and add to the conclusions from previous reports by covering issues and perspectives that previous reports may not have addressed in sufficient depth. That way you would achieve a clear value-add in this chapter without repeating previous work - whereas now the chapter is spending a lot of space essentially covering the same ground with unclear separation of what is simply re-confirming what previous reports have said, where the conclusions from previous reports are being modified, and where new conclusions are being added that were not addressed in previous reports.	partly agree, it is also good to have a section upfront on what was in SRCCL and 1.5 report	Andy Reisinger	NZAGRC	New Zealand
12031	0				Please consider inluding more information on carbon storage in boreal and temperate old-growth forests, including forest soils.	accept, we will regionalise as good as possible. but space is limited	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
12033	0				Increasing soil carbon sequestration in agricultural lands is well covered in this report. Please consider including more inforamtion on forest soil carbon sequestration.	accept, we will include. but space is limited	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
12157	0				Chapter 7 is mostly focused on mitigation (as opposed to other land-based challenges covered in the SRCCL). We encourage a broader (multi-criteria) assessment including food security, but also land degradation in line with the SRCCL. An important observation in the SRCCL, and motivation for a multi-criteria assessment, is that food security will continue to rank high on the agenda, and CC responses that are also helpful for food security have a higher chance for success.	partly agree: the core here is mitigation. But we agree the trade offs need to be developed better	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
12167	0				The chapter focuses mostly on mitigation, and especially mitigation achievements focused on GHG fluxes. However, land management, as opposed to energy based must always take into consideration other fluxes (energy, water). To be most successful, please consider to analyze land response options from a wider persepective of forcings and feedbacks.	accept, we will improve on biogeochemistry and biophysics. another CA is contacted	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
14903	0				Some references in the form of acronyms are not clearly stated, at least for the first use in the chapter. For example: SRCCL is cited for ths first time on page 7-5 without stating including the meaning, it is cited later in the following page 7-6.	editorial	Ana Blondel	Environment and Climate Change Canada / Government of Canada	Canada
14907	0				Please use Western Canada instead of West Canada	editorial	Ana Blondel	Environment and Climate Change Canada / Government of Canada	Canada
16299	0				Consider adding a description of urban forestry to Chapter 7. In particular, as urban sprawl increases globally, the ability of cities to manage their tree cover successfully can provide a significant sink for carbon. The density of woody plants can be maintained at a very high level, a process that can be called urban perforestation	noted, glossary	Daniel Helman	College of Micronesia-FSM	Micronesia, Federated States of
16301	0				In addition to the brief treatment in the case studies at the end of Chapter 7, consider adding more description of urban agriculture and its potential for climate mitigation. Including urban agriculture helps to give a more complete picture of AFOLU.	accept, we will consider, given limited space. we will have more cases	Daniel Helman	College of Micronesia-FSM	Micronesia, Federated States of
16303	0				Consider adding a section on integrated energy generation with agriculture to provide an electronic barrier to saline inundation to aquifers as sea level rises. The threat of saline inundation is significant, and the reader would benefit from a stronger treatment in Chapter 7, whether or not the mitigation of using electrical barriers is discussed	reject; out of scope of this chapter	Daniel Helman	College of Micronesia-FSM	Micronesia, Federated States of
16305	0				Consider expanding the text (or perhaps adding a section to Chapter 7) that focuses on the the differences between invention of new techniques and reclamation of traditional techniques of agriculture and forestry, as a way of building context for AFOLU processes.	noted, as part of novel techniques section	Daniel Helman	College of Micronesia-FSM	Micronesia, Federated States of
28743	0				Please check: Discussion needing on exploring cumulative mitigation potential and time dynamics of mitigation potential for promising mitigation efforts/technologies to achieve net carbon sink in agriculture and forestry sector-presently lacking	noted, we will consider time dynamics, although we clearly write in beginning that technical aspects of measures were already dealt with in Ar4 and AR5	Suvadip Neogi	TSU-WGIII-IPCC-Global Centre for Environment and Energy, Ahmedabad University, India	India
28745	0				Please check: Assessment needing on future and potential of 2nd generation biomass and biofuels in context of land based mitigation under changed climate	noted, the basis is in bioenergy section	Suvadip Neogi	TSU-WGIII-IPCC-Global Centre for Environment and Energy, Ahmedabad University, India	India
28747	0				Kindly check: Recent findings beyond SRCCL: effectiveness of management practices in agriculture/forestry on mitigation and adaptation to abate climate change>new technologies/mitigation efforts (e.g. precision agriculture practices, climate smart forestry) and their cost efficiency-needing inclusion	unclear comment	Suvadip Neogi	TSU-WGIII-IPCC-Global Centre for Environment and Energy, Ahmedabad University, India	India
28749	0				Kindly check: Integrated farming system based agro-ecologies and agroforestry potential in tropics/subtropics have better climate change adaptation-mitigation potential and provides better ecosystem services plus resilience -needs to be strengthened in form of assessment	accept we will improve the agroecology and agroforestry sections	Suvadip Neogi	TSU-WGIII-IPCC-Global Centre for Environment and Energy, Ahmedabad University, India	India
28751	0				Please check: Drivers: Information in areas like agriculture, forest, deforestation, land management - lack of information for all regions of the world and drivers of this activities	noted, our drivers section is quite regionalised. where space allows we will further improve	Suvadip Neogi	TSU-WGIII-IPCC-Global Centre for Environment and Energy, Ahmedabad University, India	India
28753	0				Kindly check: Lacks assessment on GHG reduction initiatives-finance gap and the costs to mitigate the impacts	unclear: we have reduction initiatives	Suvadip Neogi	TSU-WGIII-IPCC-Global Centre for Environment and Energy, Ahmedabad University, India	India
28755	0				Please check: Nedding more emphasis on primary tropical forests and mangrove forests in terms of their high primary productivity and soil carbon sequestration that help ameliorate climate change	accept: we will consider if space allows. we do give mitigation per measure and region	Suvadip Neogi	TSU-WGIII-IPCC-Global Centre for Environment and Energy, Ahmedabad University, India	India
33167	0				I would suggest to include partnership and international cooperation to develop effective AFOLO sectors and monitoring mechanism for monitoring progress towards mitigation	accept that our policy section needs to be improved a lot	Edris Alam	Rabdan Acadmey	United Arab Emirates

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
37439	0				A discussion of the future of the land sink due to future environmental drivers is absolutely required to evaluate the biophysical feasability of the described land-based mitigation options, in particular afforestation/reforestation and BECCS. This discussion can be informed by the outcomes of the IPCC Land Report (Section 2.4 for example), but also complemented by newer studies such as Hubau et al. (Nature, 2020) which suggest that the intact tropical forest sink may become a source earlier than currently expected.	partly accept, although impacts is in WGII. we will use that as a frame	Michiel Schaeffer	Climate Analytics	Netherlands
38733	0				General comment on the whole chapter. Gender perspectives are mostly absent. Example of gender dissagregated information that could be included: "In many countries women are only half as likely as men to use fertilizers" FAO. The state of food and agriculture 2010-11: Women in agriculture. Closing the gender gap for development. 2011. https://doi.org/https://doi.org/10.1017/S2078633611000567.	partly accept, where we can	Adriana Mordente	United Nations Convention to Combat Desertification	Germany
38749	0				Barely anything was mentioned in relation to peatland and/or wetland management to curb GHG emissions throughout the whole chapter. Here some useful info: Wetlands and peatlands are also hotspots of biodiversity, serve the purpose of natural filters of water, and often release large amounts of GHG when disturbed. Wetlands are often threatened by the expansion of agriculture due to its high fertility and nutrient availability. Disturbed peatlands and peatland forests produce between 5-15 tCO2-eq/ha/y, however the rewetting of degraded peatlands can prevent these emissions. Projects to look into: Peatland restoration and rehabilitation in Belarus. Peatland ecological rehabilitation reduced the risk of peat fires. UNDP. More than 12,000 ha of disturbed peatland forests to be restored in Belarus by “Wetlands” project 2018. http://www.by.undp.org/content/belarus/en/home/presscenter/pressreleases/2018/10/News.html.	accept: we have asked an additional CA for wetlands . this will be improved	Adriana Mordente	United Nations Convention to Combat Desertification	Germany
41341	0				For transparency and better understanding of contributions and mitigatin options: I think the aggregate CO2-equivalents should be avoided as much as possible. It will be much more useful to have information about the indvidual gases separately. When CO2-equivalent emissions are used, it as not allways clear which gases that are included and how the equivalents are calculated. The main gases in the context of ch7 - i.e. CO2, N2O and CH4 - have very different physical characersistics (lifetime and strength) as well as different sources and mitigation options. It will increase the clarity and applicability of the assessment if you discuss these separately. There are also examples in the chapter of confusing use of GWPs; e.g., when you write "net GWP". I guess what is meant is "net GWP weigthed emissions" or CO2 equivalents.	accept . where the literature allows, we will improve the assessment	Jan Fuglestvedt	CICERO	Norway
41345	0				To avoid any misunderstandings among readers about the role and differences between biogenic and fossil methane, it would be useful with a short para - or a footnote - in the beginning of the chapter explaining the difference.	noted; am not sure if we can deal with this	Jan Fuglestvedt	CICERO	Norway
44931	0				Entire Chapter. Given the scale of the biodiversity crisis and the interlinkages with Climate change it is important to reflect on the implications of these dual crises for effective climate action in land, forests and other ecosystems. Loss of biodiversity reduces ecosytem integrity and stability and increases the risk of premature release of carbon to the atmosphere. Conversely, protecting and restoring biodiversity improves ecosystem integrity and stability and reduces the risk of premature release of carbon to atmosphere. It may be useful to refer to the reference condition of an ecosystem when considering ecological integrity. It is best used to refer to the natural state, which corresponds to the condition where structure, composition and function are intact and thus dominated by natural ecological and evolutionary processes, incorporating self-regeneration, and involving dynamic equilibria in response to natural disturbance regimes. An ecosystem in its reference condition attains maximum ecological stability (Stoddard et al. 2006, Gibbons et al. 2008, Palmer and Febria 2012, Mackey et al. 2015). Synergistic action to protect and restore ecosystem integrity in land forests and other ecosystems to tackle the biodiversity and climate crises assumes a far higher level of importance for the health of the biosphere and well being of humanity than ever before. Clear guidance on synergistic action would be helpful - perhaps through a joint IPBES/IPCC work programme. But in the immediate term some synergies are obvious and high priorities for climate mitigation and adapation; and for biodiverity protection and ecosystem integrity. The highest priority (as they are irreplaceable in relevant time frames of 2030 and 2050 for both biodiversity and climate mitigation) is to prevent fragmentation, damage to and loss of, all natural carbon dense ecosystems (and in particular primary ecosystems including intact landscapes). Supporting the role of Indigenous people in maintaining healthy primary ecosystems thus also assumes a high level priority. The second is to focus restoration on actions that help rebuild ecosystem integrity and stability such as buffering and reconnecting primary ecosystems through landscape scale connectivity conservation initiaitives, encouraging natural regeneration of degraded forests and other carbon dense ecosystems and examining the potential to allow previously logged natural forests to regain their biological potential (a potentially important mitiagtion pathway as natural wood production forests are on average 50% below their natural carbon carrying capacity and have enormous potential to help restore biodiversity, ecosystem integrity, stability and resilience (Moomaw et al 2019, Keith et al 2009). The potential of current plantations and semi natural forests to satisfy commodity wood production needs appears to be high (FAO 2010). There is also significant potential for action to result in adverse impacts on biodiversity and ecosystem integrity. Unconstrained expansion of mono culture plantations and bioenergy tree and other crops being the notable examples. There is also evidence of adverse interaction between past and current forest management practices, once assumed to be sustainable, with increased risk of vulnerability to drought and fire and exacerbation of fire intensity and extent in a warming world (Lindemmayer and Sato 2018)	accept, thanks for good reflection. we will deal with trade offs and synergies in a more comprehensive manner in SOD	Virginia Young	Australian Rainforest Conservation Society, Griffith University, CAN Ecosystems	Australia

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
46223	0				Entire Chapter. Given the scale of the biodiversity crisis and the interlinkages with Climate change it is important to reflect on the implications of these dual crises for effective climate action in land, forests and other ecosystems. Loss of biodiversity reduces ecosytem integrity and stability and increases the risk of premature release of carbon to the atmosphere. Conversely, protecting and restoring biodiversity improves ecosystem integrity and stability and reduces the risk of premature release of carbon to atmosphere. It may be useful to refer to the reference condition of an ecosystem when considering ecological integrity. It is best used to refer to the natural state, which corresponds to the condition where structure, composition and function are intact and thus dominated by natural ecological and evolutionary processes, incorporating self-regeneration, and involving dynamic equilibria in response to natural disturbance regimes. An ecosystem in its reference condition attains maximum ecological stability (Stoddard et al. 2006, Gibbons et al. 2008, Palmer and Febria 2012, Mackey et al. 2015). Synergistic action to protect and restore ecosystem integrity in land forests and other ecosystems to tackle the biodiversity and climate crises assumes a far higher level of importance for the health of the biosphere and well being of humanity than ever before. Clear guidance on synergistic action would be helpful - perhaps through a joint IPBES/IPCC work programme. But in the immediate term some synergies are obvious and high priorities for climate mitigation and adapation; and for biodiverity protection and ecosystem integrity. The highest priority (as they are irreplaceable in relevant time frames of 2030 and 2050 for both biodiversity and climate mitigation) is to prevent fragmentation, damage to and loss of, all natural carbon dense ecosystems (and in particular primary ecosystems including intact landscapes). Supporting the role of Indigenous people in maintaining healthy primary ecosystems thus also assumes a high level priority. The second is to focus restoration on actions that help rebuild ecosystem integrity and stability such as buffering and reconnecting primary ecosystems through landscape scale connectivity conservation initiaitives, encouraging natural regeneration of degraded forests and other carbon dense ecosystems and examining the potential to allow previously logged natural forests to regain their biological potential (a potentially important mitiagtion pathway as natural wood production forests are on average 50% below their natural carbon carrying capacity and have enormous potential to help restore biodiversity, ecosystem integrity, stability and resilience (Moomaw et al 2019, Keith et al 2009). The potential of current plantations and semi natural forests to satisfy commodity wood production needs appears to be high (FAO 2010). There is also significant potential for action to result in adverse impacts on biodiversity and ecosystem integrity. Unconstrained expansion of mono culture plantations and bioenergy tree and other crops being the notable examples. There is also evidence of adverse interaction between past and current forest management practices, once assumed to be sustainable, with increased risk of vulnerability to drought and fire and exacerbation of fire intensity and extent in a warming world (Lindemmayer and Sato, Hidden collapse is driven by fire and logging in a socioecological forest ecosystem', PNAS 2018)	see comment response above, double comment	Virginia Young	Australian Rainforest Conservation Society, Griffith University, CAN Ecosystems	Australia
47515	0				General comment Chapter 7: The draft chapter is of very low quality overall (compared to other chapters) and generally not ready for review. There are major gaps and inconsistencies in the presentation, important sources of evidence and points of views ignored (or not yet included) and the poor drafting distracts from substantive comments. It requires not just redrafting, but a very substantial rethinking of the overall approach to presenting the sectors covered.	accept, a major rewrite will take place	Zoltán Rakonczay	European Commission, Directorate General for Research	Belgium
47517	0				Chapter 7 mostly lacks indications of uncertainty (either in the form of uncertainty language or as confidence intervals given for estimates). This often leads to a false sense of certainty and precision about statements and figures that are highly uncertain and/or subject to significant debate in the literature.	accept, a major rewrite will take place	Zoltán Rakonczay	European Commission, Directorate General for Research	Belgium
47519	0				Chapter 7 uses key terms rather inconsistently. It would be beneficial to consistently apply at least those terms and definitions that are established under the UNFCCC, its Kyoto Protocol and the Paris Agreement, as well as IPCC terminology used in inventories. For example, "sinks" are defined under the UNFCCC, but under that definition neither harvested wood products, nor biochar could be considered "sinks" (although they could represent an increasing pool).	accept, we will check terminology	Zoltán Rakonczay	European Commission, Directorate General for Research	Belgium
47521	0				Chapter 7 fails to clarify what emissions and removals it intends to include under its scope and the contents is inconsistent in its coverage. The chapter title is "AFOLU" and much (but by no means all) of the text is written with the interpretation that "AFOLU" only includes "anthropogenic" emissions and removals. Given that the authors subscribe to the very questionable and unsubstantiated) interpretation that the bulk of the residual carbon sink is non-anthropogenic (termed in the report as "natural response of land to human-induced environmental change"), in most of the chapter "AFOLU" appears as a net GHG source and most of the discussion ignores the sink attributed to the forementioned response, as well as direct human impacts thereon (e.g., forgone sequestration resulting from future land-use changes). However, some parts of the text do address the residual sink, but inconsistently and incompletely. It would be advisable to expllicitly include in the chapter all greenhouse gas emissions and removals by terrestrial ecosystems (as well as associated indirect emissions, such as N2O from estuaries and marine systems emanating from land-based nitrogen sources) and treat them consistently whereever relevant.	partly agree; we have a good section 7.2 and 7.8, that will be merged . it will be clarified that we include the human induced activities only in the mitigation . the role of the natural sinks is addressed in WGI	Zoltán Rakonczay	European Commission, Directorate General for Research	Belgium
47523	0				Chapter 7 uses units (emissions, areas, etc) rather inconsistently and sometimes wrongly (e.g., incorrect conversion between C and CO2 in XXX). This should be harmonised.	accept, we will improve throughout	Zoltán Rakonczay	European Commission, Directorate General for Research	Belgium
47525	0				Chapter 7 should use metrics in a more circumspect way. It generally uses (or assumes the use of) GWP 100, without any consideration for the relevance of other metrics, in particular for methane. There should be a more consistent consideration for other metrics, which could be achieved by consistently quantifying non-CO2 GHG emissions (also) in natural units (mass of emissions) without conversion to CO2e.	partly accept, a metrics cross chapter working group is ongoing. we will use information from that group.	Zoltán Rakonczay	European Commission, Directorate General for Research	Belgium

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
47527	0				Chapter 7 uses the term "mitigation" (or "contribution to mitigation", as in line 27 of p.3) in an inconsistent and untransparent manner, without attempting to provide a consistent interpretation. Often the sheer existence of removals is interpreted as "mitigation" (as seems to be the case in the presentation of various offset schemes), without regard to additionality, leakage, verification and the like. Similarly, mitigation potentials are presented without sufficient consideration for the fact that land-based mitigation options generally compete with each other, therefore they cannot be considered simultaneously attainable (they are not additive). There is also a lack of reflection on the irreducible trade-offs (or emission costs) in other sectors (e.g., that bioenergy systems based on large areas of dedicated crops need a lot of energy in the form of agronomic inputs, harvest, collection and transport), so the apparent GHG benefits based on land carbon balances cannot be considered to represent the mitigation potentials.	partly agree, on definitions I agree, we need to do better. on bioenergy a cross chapter bioenergy appendix will be written, to provide a balanced approach	Zoltán Rakonczay	European Commission, Directorate General for Research	Belgium
47529	0				Chapter 7 makes disproportionate use of single sources, often for key findings (such as for reporting on the change of global tree cover or the attribution of the residual carbon sink), even in cases where the single source is unconfirmed, disputed and/or inconsistent with a broad body of evidence. Whilst the sources relied on may represent the best estimate available, their acceptance would benefit from an explanation of the apparent discrepancies with other sources or earlier understanding.	agree, in SOD, literature referencing will be better	Zoltán Rakonczay	European Commission, Directorate General for Research	Belgium
47531	0				Chapter 7 does not present the assumptions underpinning many of the estimates it presents. E.g., for bioenergy (especially with CCS) it does not provide the basic process parameters (e.g., indicative yield, process emissions, capture efficiency, etc.) assumed, which would allow the reader to put the estimates in context or update them in light of technological progress.	reject: we cannot go into a full LCA of all literature. we represent collections of literature on the subject already existing. also a cross chapter bioenergy section in Ch 12 will be written	Zoltán Rakonczay	European Commission, Directorate General for Research	Belgium
47533	0				Chapter 7 is inconsistent in its consideration of factors important for the assessment of mitigation potentials. In various parts of the chapter it mentions factors such as displacement (indirect land-use change), yield impact, inputs factors (such as fertilisation needs), transient impacts (such as initial carbon losses from land conversion) and impact on pre-existing sink (foregone sequestration) as important factors that cna influence or negate the mitigation benefits and/or limit the scale of deployment, but generally only one or tow of these are taken into account, and in some cases none at all.	accept, agree we need to represent literature better	Zoltán Rakonczay	European Commission, Directorate General for Research	Belgium
47535	0				Chapter 7 makes frequent reference to "consistency" (of various AFOLU or bioenergy measures) with different mitigation ambitions (such as 1.5 degree or "below two degree" objectives), but generally without making it clear what pathway(s) is (are) assumed for other sectors or what the confidence level of the target would be. AFOLU ambitions should not be seen in isolation, without considering efforts in other sectors.	agree to the point made, but this is part of chapter 3 and 4. indeed consistency between those chapter and the4 afolu chapter will be checked	Zoltán Rakonczay	European Commission, Directorate General for Research	Belgium
18443	1	1	1	1	There is a lot of duplications on BECCS with chapters 3 and 6, please enhance coordination among the chapters	accept, these consistency checks will take place towards the SOD, also with ch 12	Chang Shiyan	Tsinghua University	China
32213	1	1	1	1	Suggested article that may be considered in context of non market approaches: Gupta H. & Dube, L. C. (2018). Addressing biodiversity in climate change discourse: Paris mechanisms hold more promise. The International Forestry Review Volume 20, Number 1, March 2018, pp. 104-114(11), published by the Commonwealth Forestry Association, UK. (https://doi.org/10.1505/146554818822824282)	noted ; we will consider this in the policy and trade off section	LOKESH CHANDRA DUBE	NATCOM Cell, Ministry of Environment, Forest and Climate Change, Government of India	India
32215	1	1	1	1	Suggested article that may be considered in context REDD+ and NYDF: Dube L. C. (2019). Conserving Carbon and Biodiversity Through REDD+ Implementation in Tropical Countries. Climate Change, Food Security and Natural Resource Management (pp.281-297). Springer. (https://doi.org/10.1007/978-3-319-97091-2_15).	noted ; we will consider this in the policy and trade off section	LOKESH CHANDRA DUBE	NATCOM Cell, Ministry of Environment, Forest and Climate Change, Government of India	India
32223	1	1	1	1	A dedicated section on food-energy-water nexus may be included.	disagree: we have trade offs already in a specific section.	LOKESH CHANDRA DUBE	NATCOM Cell, Ministry of Environment, Forest and Climate Change, Government of India	India
27629	1	1	100	40	Chapter 7 doesn't seem to include GHG emissions from land permafrost, ocean floor, ecosystems, and all soil. I wonder where they are included. I f they aren't yet, I suggest to appoint experts to report these 4 sources of ghg emissions, such as Natalia Shakova for ocean floor methane emissions.	disagree, ocean floor is not part of our chapter. we do however include other land use types like coastal wetlands, etc. For baseline emissions, the whole AFOLU sector is represented in the emissions trends and drivers section,	Dorota Retelska	Independent	Switzerland
27631	1	1	100	40	Protocols for soil carbon capture and reforestation should be made available, they might be massively used soon. Yet more research in this field could improve results a lot.	disagree, the chapter is not about protocols.	Dorota Retelska	Independent	Switzerland
27633	1	1	100	40	Could you discuss the possiblities of massive carbon capture in soil and vegetation to mitigate abrupt, runaway climate change? IIn the next 10 years it might be the only available technology	disagree, outside the scope of the chapter, although we do provide mitigation options by time scales of 2030 and 2050. 2030 is already in less than 10 years time	Dorota Retelska	Independent	Switzerland
14897	1		100		There are several editorial corrections e.g. subscript/superscrit, uniform pattern of et al. across the chapter, DoI of few references are not correct etc.	accept, will be corrected	Niveta Jain	ICAR-Indian Agricultural Research Institute	India

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
17347	1	1	101	14	The economy-related aspects of the mitigation measures in local scales are poorly addressed. It is unclear how the difference of the local dependency on agriculture can affect the feasibility of the mitigation measures. Not all the communities are equally dependent on land and agriculture for their living.	partly agree. However the chapter can only give the large scale mitigation options and its economic aspects. we divide this even by 10 regions in the world. the very local cannot be addressed, although some case studies provide more insight	Zeyaeyan Sadegh	Islamic Republic of Iran Meteorological Organization (IRIMO)	Iran
17337	1	1	129	27	Please apply one definition for afforestation, reforestation and forest restoration consequently throughout the chapter, including when evaluating or referencing literature. As it is now, different definitions are used and this leads to a high variability in the estimates and assessments provided here. For example, at one place the definitions from the KP are used (which are way off from the definitions used e.g. in forest sciences and forest management), at another place reforestation is subsumed in forest restoration, someplace reforestation is defined to be done after land use change, other definitions explicitly exclude land use change and define reforestation as done on lands that were just temporarily not covered by trees, e.g. following a clearcut harvest or a large-scale disturbance. Please sort out this - sorry to say so - mess. I strongly suggest to use definitions from the forest and forest management sciences, e.g. included in FAO FRA (http://www.fao.org/3/a-am665e.pdf), or compiled by forest experts (https://efi.int/sites/default/files/files/publication-bank/2018/ir_06.pdf). Please do not use defnitions from frameworks where formalities were more important than biological or natural situations (e.g., the differentiation in the KP definitions is practically worthless for mitigation planning). If you want the assessments to be correct, you want to use but one definition. If you want the results to be applicable in the real world, you want to use a definition coherent with the understanding in forest sciences and forest management.	disagree, we follow the IPCC glossary . this is most consistent. we cannot follow separate and different definitions form e.g. forest scientists	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany
38959	1	1	129	27	I think that the resolution of the figures could be improved. Not very clear when printed. E.g. 7.11; 7.12	editorial accept	Vassilis Litskas	Cyprus University of Technology; Open University of Cyprus	Cyprus
38967	1	1	129	27	There are a lot of editorial errors, I am not uploading them as your request.	editorial accept	Vassilis Litskas	Cyprus University of Technology; Open University of Cyprus	Cyprus
38981	1	1	129	27	I have the feeling that more recent references are needed in many cases.	accept, will be improved in SOD	Vassilis Litskas	Cyprus University of Technology; Open University of Cyprus	Cyprus
27219	1	1	129	29	Many papers cited in the document still not appear in the reference list. I did not check all of them but mention them when I see one.	accept, will be improved in SOD	Marc Aubinet	University of Liege	Belgium
32957	1		129		The readability of the chapter would greatly benefit from a consistent usage of units with regard to carbon emission and carbon stocks.	accept, will be improved in SOD	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
21555	2	27	2	28	page format	accept, will be improved in SOD	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
1859	2	32	2	32	Add sub-heads 'Ecosystem Services- qualitative : efficiency evaluation' , 'Food Security- Agricultural Land', 'Land Capability check- Urban Land-Use'	accept, section will be rewritten and reflected in contents list	Alka Bharat	Department of Architecture & Planning, M.A.National Institute of Technology (An Institute of National Importance),Bhopal (M.P.)	India
1861	2	32	2	32	Add ; 'Sustainable Land Management " , 'GHG fluxes in Terrestrial Ecosystems'	accept, section will be rewritten and reflected in contents list	Alka Bharat	Department of Architecture & Planning, M.A.National Institute of Technology (An Institute of National Importance),Bhopal (M.P.)	India
35101	2	8		30	Need re-alignment	editorial accept	Happiness Nnko	The University of Dodoma	United Republic of Tanzania
216	3	4	3	4	expectation for (change on to for)	editorial accept	Karen A. Beauchemin	Agriculture and Agri-Food Canada	Canada

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
19677	3	4	3	5	should not political will be mentioned as well? Changing government regimes/ political pragmatism provides a confounding factor to this	reject, political will is an overarching subject.	Mochamad Indrawan	Research Center for Climate Change - Universitas Indonesia (RCCC-UI)	Indonesia
11255	3	4	3	6	Not sure if this para is good start expectation from land is not only for mitigation but also adaptation	reject, this report is about mitigation	Mahmood Riyaz	Maldivian Coral Reef Society	Maldives
12057	3	4	3	6	Would it be possible to use a more precise formulation than "...deliver mitigation.." here?	accept, we will rephrase	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
28055	3	5	3	6	conversion of natural land should be replaced by conversion of natural habitat or natural ecosystem	accept, we will rephrase	Alix Frank Rodrigue Idohou	National University of Agriculture	Benin
1847	3	6	3	6	natural land' … ?	accept, we will rephrase	Alka Bharat	Department of Architecture & Planning, M.A.National Institute of Technology (An Institute of National Importance),Bhopal (M.P.)	India
22259	3	7	3	7	Should indicate efficient use or sustainable use...	reject, sustainable use should not be a part of this first sentence	Noureddine Benkeblia	The University of the West Indies	Jamaica
17907	3	7	3	9	Clarify why it is 'necessary'	reject, necessity comes from earlier chapters, e.g. ch 2 and 3	Luke Spajic	University of Adelaide (graduate student researcher), University of Oxford (visiting student researcher)	Australia
12049	3	7	3	17	It would be useful if these numbers could be summarized in a figure to be included later in the report	reject, graphs are not here, they follow in main text	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
26831	3	7	3	17	Fix the sentence structure in this section	accept, sentence can be improved	Louis Verchot	International Center for Tropical Agriculture	Colombia
27243	3	7	3	17	First statement-sentence is to complex, expressions like "play a vital dual role" are difficult to understand and eventually too generic. The link to the next entry (ln 19-21) is not clear and partly redundant. The explaining text does not sustain the entry statement. Also: the language needs some improvements in stringency, it is much casual speak.	accept, sentence can be improved	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
46141	3	7	3	17	Ranges in Gt CO2 eq yr-1 are missing in this paragraph	accept, sentence can be improved	Daniel Ortiz-Gonzalo	Department of Geosciences and Natural Resource Management, Faculty of Science, University of Copenhagen	Denmark
18111	3	7	3	21	Not balanced and conclusive. This text should present an assessment, not add contradictory statements without providing an evaluation what seems more likely (e.g. growing vs. shrinking forests). A statement like "the role of… remains unclear" is not very helpful; it would be better to summarize what CAN be said (with what certainty/uncertainty)	accept, sentence can be improved	Helmut Haberl	Institute of Social Ecology, University of Natural Resources and Life Sciences, Vienna	Austria
16819	3	9	3	9	"because of its necessary contribution to"…a bit unclear. "because of its prominent contribution.."?	accept, sentence can be improved	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
31963	3	9	3	10	being the only sector for which it is currently feasible to enhance removals at scales that can contribute to carbon neutrality', is this true? How about	reject, statement is true	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
12045	3	10	3	10	Please consider to include a definition og "carbon neutrality" in glossary, or include this term in the definiton of "net zero CO2-emissions"	reject, this is in glossary already	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
218	3	11	3	11	globally a source of 23% of important driver of GHG emissions - gammatically incorrect	accept, sentence can be improved	Karen A. Beauchemin	Agriculture and Agri-Food Canada	Canada
3047	3	11	3	11	Here and throughout - some incomplete sentences/lack of clarity. Check sentence structure.	accept, sentence can be improved	Dave Reay	University of Edinburgh	United Kingdom (of Great Britain and Northern Ireland)
4907	3	11	3	11	"23% of important driver of" needs editorial revision	accept, sentence can be improved	Patrick Lamers	National Renewable Energy Laboratory	United States of America
12043	3	11	3	11	Please consider to remove "important driver"	accept, sentence can be improved	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
25861	3	11	3	11	The sentence is not clear. The 23 % of what?	accept, sentence can be improved	Jorge Hoyos-Santillan	University of Magallanes	Chile

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
38875	3	11	3	11	Please check language: suggested edits: AFOLU is globally a source of 23% of important driver ofanthropogenic GHG emissions	accept, sentence can be improved	francesco tubiello	FAO	Italy
38877	3	11	3	11	It is not necessarily transparent to begin characterizing the contribution of any sector to total emissions by giving percentages. Better to also state immediately what the total absolute emissions are	accept, we will consider this . and add absolute totals	francesco tubiello	FAO	Italy
39761	3	11	3	11	this sentence doesn't make sense	accept, sentence can be improved	David Manning	Newcastle University	United Kingdom (of Great Britain and Northern Ireland)
41369	3	11	3	11	I suggest avoiding the use of contribution to total GHG emission. This number (23%) is actually not conveying much informaition in terms of contribution to climate change. And as explained so well in chapter 2 (section 2.2.1, 2nd para), this number changes due to changes in GWPs and may therefore convey rather imprecise and irrelevant information. It is better and clearer of you give the contribution to total emissions per gas; i.e. CO2 AFOLU contribution to total CO2, and AFOLU CH4 contribition to total CH4 emissions, etc.	accept, we will consider this . see also comm 116	Jan Fuglestvedt	CICERO	Norway
46133	3	11	3	11	"The AFOLU sector is globally a source responsible of for 23% anthropogenic important driver of GHG emissions…"	accept, sentence can be improved	Daniel Ortiz-Gonzalo	Department of Geosciences and Natural Resource Management, Faculty of Science, University of Copenhagen	Denmark
3217	3	11	3	12	The sentence: AFOLU is globally a source of 23% of important driver of GHG emissions, as well as being a 12 large carbon store, a human induced sink and a natural sink" should be modiefied in order to enhance clarity. One option would be the following: AFOLU contributes 23% to the global GHG emissions and is therefore a strong driver of climate change. However, it provides also storage to a large amount of carbon, and is a human induced and a natural sink of carbon dioxide.	accept, sentence can be improved	Klaus Radunsky	retired from Umweltbundesamt	Austria
29149	3	11	3	12	This sentence is not clear enough. Reformulation might be needed	accept, sentence can be improved	SMAIL KHENNAS	Energy and Climate Change Consultant	United Kingdom (of Great Britain and Northern Ireland)
32217	3	11	3	12	"AFOLU is globally a source of 23% of important driver of GHG emissions, as well as being a large carbon store, a human induced sink and a natural sink." Change to "AFOLU is globally a source of 23% of GHG emissions. Being a human induced sink and a natural sink it also acts as large carbon store "	accept, sentence can be improved	LOKESH CHANDRA DUBE	NATCOM Cell, Ministry of Environment, Forest and Climate Change, Government of India	India
232	3	11	3	13	sentences not clear	accept, sentence can be improved	Diego Morgavi	INRAE	France
556	3	11	3	13	text not clear	accept, sentence can be improved	Pierre Bernier	Natural Resources Canada	Canada
47537	3	11	3	13	It is an extremely confusing introduction, where AFOLU is presented both as a net sink and as a net source. In most parts of the chapter the net sink is attributed to solely "natural" causes and thus excluded from AFOLU (effectively limiting AFOLU to what is considered to be "anthropogenic"). However, it is never clearly explained when and why the (supposedly) "natural" sink would be included or excluded, and why a response to clearly "human-induced" factors would ever be considered non-anthropogenic, when it could not and would not happen without human impact, and no AFOLU sink would ever happen without a "natural" response.	accept, sentence can be improved	Zoltán Rakonczay	European Commission, Directorate General for Research	Belgium
14	3	11	3	14	Rephase sentences to 'Globally, AFOLU is a source of 23% of GHG emissions as well a large carbon store and a human induced sink and natural sink. The natural sink accounts for around 29% of anthropogenic CO2 emissions. In between 2007-2016, about 14% of total global anthropogenic CO2 emissions, 44% of CH4 and 88% of N2O came from AFOLU".	accept, sentence can be improved	Stella Kabiri-Marial	National Agricultural Research Organisation	Uganda
1489	3	11	3	17	This sentence is confusing. AFOLU is a source of 23% of GHG emissions (not 23% of driver). For carbon store, can any numbers/percentage be provided? Global tree cover or emissions from tree cover? This sentence is not consistent with the one after "while other sources…"	accept, sentence can be improved	JUNGUO LIU	Southern University of Science and Technology	China
39829	3	11	3	17	Please provide ranges (uncertainty) of the estimated numbers.	accept, we will add ranges where possible	Hasegawa Toshihiro	National Agricultural and Food Research Organization	Japan
16821	3	12	3	12	"The latter for around 29%." no clear what latter refers to. Pls re-write.	reject, this is normal grammar	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
38879	3	12	3	12	AFOLU is a IPCC category for antrhopogenic emissions/removals. How can it be responsible for a "natural" sink? Nature is responsible fo rthe natural sink, not AFOLU as defined in IPCC.	accept, sentence can be improved	francesco tubiello	FAO	Italy
220	3	12	3	13	no verb in sentence	accept, sentence can be improved	Karen A. Beauchemin	Agriculture and Agri-Food Canada	Canada
12047	3	12	3	13	It is unclear which sink "latter" refers to.	reject, this is normal grammar	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
32219	3	12	3	13	Contextual meaning of the sentence "The latter for around 29% of anthropogenic CO2 emissions." is not clear.	reject, this is normal grammar	LOKESH CHANDRA DUBE	NATCOM Cell, Ministry of Environment, Forest and Climate Change, Government of India	India
38881	3	12	3	13	The natural sink is not part of AFOLU. Secondly, it is ambiguous to report the fraction of anthropogenic emissions removed b ya natural process, since this is obviously the fraction with which such process removes all atmospheric CO2, anthropogenic and natural.	accept, we will distinguish this better	francesco tubiello	FAO	Italy
38883	3	13	3	14	Please check these percentages against those reported in the SRLCC. Secondly, some databases (FAOSTAT) are available to 2017 (and soon 2018). FAO and previous lilterature including AR5 reports the percentage of N2O emissions fro AFOLU around 75% (Tubiello, 2019). 88% appears way too high.	reject, numbers are same as in SRCCL	francesco tubiello	FAO	Italy
38885	3	13	3	14	These percentages are computed with respect to which anthropogenic total?	accept, we will consider this . and add absolute totals	francesco tubiello	FAO	Italy
1843	3	14	3	14	N2O	accept, editorial	Alka Bharat	Department of Architecture & Planning, M.A.National Institute of Technology (An Institute of National Importance),Bhopal (M.P.)	India
19923	3	14	3	14	N2O: 2 should be subscript	accept, editorial	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
28057	3	14	3	14	for N2O, 2 should be considered as index	accept, editorial	Alix Frank Rodrigue Idohou	National University of Agriculture	Benin
46135	3	14	3	14	Need for a subscript (N2O)	accept, editorial	Daniel Ortiz-Gonzalo	Department of Geosciences and Natural Resource Management, Faculty of Science, University of Copenhagen	Denmark
4909	3	14	3	15	"Global tree cover has increased while other sources show a decline." Are you implying tree cover = carbon stored in forests? Thus loss of tree cover = carbon source? Suggest revision or breaking up into separate sentences. Futher, it is unclear what entails low confidence: only for other sources or also for tree cover?	accept, sentence will be improved	Patrick Lamers	National Renewable Energy Laboratory	United States of America
19679	3	14	3	15	Global tree cover has increased since 1981, while other sources show a decline (low confidence)	accept, sentence will be improved	Mochamad Indrawan	Research Center for Climate Change - Universitas Indonesia (RCCC-UI)	Indonesia
19925	3	14	3	15	"Global tree cover has increased since 1981, while other sources show a decline ": a contradiction. I suggest deciding for sayin either increase or decrease (low confidence), or saying with current evidence the direction of change cannot be established.	accept, sentence will be improved	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
38887	3	14	3	15	global tree cover'' is not a source of AFOLU emissions/removals, as the text currently implies. Please revise	accept, sentence will be improved	francesco tubiello	FAO	Italy
38889	3	14	3	15	Please explain how ''tre e cover'' is related to AFOLU. It isn't. Land use category ''forest land'' is part of AFOLU, however increases in tree cover per se do not imply anything about AFOLU emissions/removals. In any case, What is the source of tree cover increase since 1981 (a pre-satellite era)?. This sentence is quite at odd with the otherwise well known fact that forest area (this of course directly relatd to AFOLU) has continuously decreased since 1990.	reject, tree cover is part of Other land use, so part of AFOLU. tree cover has increased as published in Nature 2018. still indeed forest according to definition is decreasing net. sentence will be improved	francesco tubiello	FAO	Italy
38891	3	14	3	15	Please re-write for clarity and consistency, and indiacte which other sources are being referred to	accept, sentence will be improved	francesco tubiello	FAO	Italy
47539	3	14	3	15	An increase in global tree cover is categorically stated, based on a single, unconfirmed source. It is unclear whether the "low confidence" applies to the increase or to the "other sources" (which contradict it without exception) or to both.	partly reject tree cover has increased as published in Nature 2018. sentence will be improved	Zoltán Rakonczay	European Commission, Directorate General for Research	Belgium
16	3	14	3	17	This statement is uncordinated from the previous and following paragraphs. I suggest removal of 'Global tree cover has increased since 1981, while other sources show a decline (low confidence) with strong regional differences of generally losses in tropical regions and gains in temperate and boreal regions.	partly reject tree cover has increased as published in Nature 2018.	Stella Kabiri-Marial	National Agricultural Research Organisation	Uganda
234	3	14	3	17	rephrase, not clear. i.e. "while other sources" what are these other sources? "differences of generally losses ..." refers to global tree cover or other sources?	accept, sentence will be improved	Diego Morgavi	INRAE	France
558	3	14	3	17	sentence seems out of place	accept, sentence will be improved	Pierre Bernier	Natural Resources Canada	Canada
3171	3	14	3	17	Re: "Global tree cover has increased since 1981, while other sources show a decline ...". The meaning of the sentence is unclear. Please clarify whether global tree cover has increased or declined. Please indicate the Section(s) referenced	accept, sentence will be improved	Sai Ming LEE	Hong Kong Observatory	China

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
12055	3	14	3	17	Global tree cover has "declined"….? What is "other sources"? Please consider to explain. "..other sources, such as,…"	partly reject tree cover has increased as published in Nature 2018.	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
18623	3	14	3	17	Does this mean that some studies report increase in global tree cover and some studies indicate descrease in global tree cover? Maybe it would be clearer to simply state that there is uncertainty in the trend of global tree cover.	partly reject tree cover has increased as published in Nature 2018.	Charlotte Janssens	KU Leuven	Belgium
25741	3	14	3	17	What does 'other sources' refer to here?	accept, sentence will be improved	Helen Hughes	University of Edinburgh	United Kingdom (of Great Britain and Northern Ireland)
19681	3	15	3	15	is such trend likely? Not with the recent fires in Amazon and Australia surely?	partly reject tree cover has increased as published in Nature 2018.	Mochamad Indrawan	Research Center for Climate Change - Universitas Indonesia (RCCC-UI)	Indonesia
46137	3	15	3	15	"while other sources have shown a decline…"	accept, sentence will be improved	Daniel Ortiz-Gonzalo	Department of Geosciences and Natural Resource Management, Faculty of Science, University of Copenhagen	Denmark
46139	3	15	3	15	(low confidence) should be placed at the end of the sentence	accept, editorial	Daniel Ortiz-Gonzalo	Department of Geosciences and Natural Resource Management, Faculty of Science, University of Copenhagen	Denmark
44143	3	15	3	16	Instead of generally losses, "general losses" seems more appropriate.	accept, editorial	Tshepiso Mafole	University of Cape Town	South Africa
42691	3	18	3	18	Instead of the word "pledges", commitments or another word may be preferable to make the sentence read well.	accept, editorial	Eromose Ebhuoma	University of South Africa	South Africa
46143	3	18	3	18	This paragraph seems to be isolated here. Could it be merged with a policy paragraph? e.g. page 7-4, from line 3 to 13	reject, we need to set the goals of countries at early stage	Daniel Ortiz-Gonzalo	Department of Geosciences and Natural Resource Management, Faculty of Science, University of Copenhagen	Denmark
1845	3	18	3	19	expect 25% … remains unclear' …. Basis ?	accept, change expect to ' aim'	Alka Bharat	Department of Architecture & Planning, M.A.National Institute of Technology (An Institute of National Importance),Bhopal (M.P.)	India
10383	3	18	3	19	25% of pledged mitigation - is this mitigation below BAU, or below some reference level? Clarify	accept, rephrase the sentence ' compared to BAU	Andy Reisinger	NZAGRC	New Zealand
12187	3	18	3	20	I have a concern particularly the later part of this sentence, please rephrase to make it clear.	accept, sentence will be improved	Mohammad Ibrahim Khalil	University College Dublin	Ireland
25743	3	18	3	21	As part of an exec summary that can be read standalone, this paragraph doesn't make sense. What relevance is the second sentence to the NDCs? Suggest the two sentences need to be linked or worked into other paragraphs as appropriate.	accept, we will reconsider. and rephrase	Helen Hughes	University of Edinburgh	United Kingdom (of Great Britain and Northern Ireland)
26833	3	18	3	21	It is not clear why these two sentences belong in the same paragraph. The role of albedo, evapotranspiration, and VOCs in the total climate forcing of land use is actually getting clearer. The recent paper by Scott et al. (2018) in Nature Communications gives a nice update on the current understanding.	accept, we will reconsider. and rephrase	Louis Verchot	International Center for Tropical Agriculture	Colombia
38731	3	18	3	21	As of 2019 more than 165 NDCs representing 197 countries included specific land-based activities for mitigation and/or adaptation. This is more than 83% of countries who submitted NDCs	partly accept the suggestion. but the pledged emissions reduction that needs to be achieved by afolu is only 25% of total mitigation	Adriana Mordente	United Nations Convention to Combat Desertification	Germany
16817	3	19	3	19	"primarily reduced deforestation" > "primarily via reduced deforestation"	accept, editorial	Ranjith Gopalakrishnan	University of Eastern Finland	Finland

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
560	3	20	3	20	This executive summary statement on albedo is in contradiction with the chapter content (p. 42, l. 32-35; table 7.12). Albedo is a direct measure of solar energy not retained in the earth climate system. Locally its effect on energy budget is uncontroversial and substantial (see studies cited in the SRCCL, Chap 2), especially at high latitudes when coupled with radiative losses (see Lee et al 2011 doi:10.1038/nature10588). Stating that the role of albedo remains unclear may stem from the uncertainties in global models ("…in the total climate forcing of land use…") with respect to possible feedbacks. I would argue that the same uncertainties in feedbacks apply to the capture of CO2 by growing trees because this growth is also linked to changes in transpiration and BVOCs. Given the robust and convergent empirical evidence, I beileve that the IPCC MUST give guidance to policy makers with respect to local afforestation projects with a statement couched in appropriate uncertainty terms. A suggestion: "In high latitudes with winter snow cover, changes in albedo from local afforestation are very likely to reduce or eliminate the climate benefits of CO2 capture by tree growth".	accept partly, we attracted a CA on albedo, VOC and physical effects	Pierre Bernier	Natural Resources Canada	Canada
4911	3	20	3	20	remove "some"	accept, editorial	Patrick Lamers	National Renewable Energy Laboratory	United States of America
1675	3	20	3	21	In support of my argument regarding the significance of albedo-related radiative forcing for afforestation in boreal areas, please see Griscom et al, PNAS 2017 (https://doi.org/10.1073/pnas.1710465114), and in particular the legend of their figure S1 that states "Boreal zones are excluded from reforestation (A) due to albedo". The substantial list of authors involved in this study underlines the broad scientific consensus on this issue. The current statement in the ES is not supported by this reference and should be modified to reflect this scientific consensus.	accept, we attracted a CA on albedo, VOC and physical effects	Pierre Bernier	Natural Resources Canada	Canada
2639	3	20	3	21	Should not a summary summarize information elements present in the body of the chapter? This is not the case here: although albedo is mentioned on page 7 line 26 in a sentence which refers to section 7.3, this word is not found in 7.3. Same thing for evapotranspiration. Besides, the text mentions effects due to land use change, rather than the other way around. Finally VOCs are not mentioned anywhere else in this chapter!	accept, we attracted a CA on albedo, VOC and physical effects	Philippe Waldteufel	CNRS/IPSL/LATMOS	France
4913	3	20	3	21	Need to clarify whether the role of albedo, ET, VOCs is a research need and/or commitments are unclear as part of the NDC.	accept, we attracted a CA on albedo, VOC and physical effects	Patrick Lamers	National Renewable Energy Laboratory	United States of America
10385	3	20	3	21	"The role of albedo … remains unclear" - this statement is unclear. Is it the role that remains unclear, or the magnitude - and is it the role, magnitude or direction of each component individually, or the magnitude of the some of the elements? Is it unclear from a science perspective, or their treatment in mitigation policies (i.e. unclear to scientists or unclear to policymakers)? Please use more precise language to avoid misunderstandings.	accept, we attracted a CA on albedo, VOC and physical effects	Andy Reisinger	NZAGRC	New Zealand
30535	3	20	3	21	The statement "The role of albedo, evapotranspiration, and VOCs in the total climate forcing of land use remains unclear" is far too dismissive - there is actually an extremely large body of literature on the effects of AFOLU on albedo, and the radiative forcing due to to land cover-related surface albedo change has been quantified by Working Group 1 with increasing levels of confidence and scientific understanding since the Third Assessment Report. Albedo effects are mentioned in the SPM of the IPCC Special Report on Climate Change and Land (SRCCL) with "high confidence". There is also an established body of literature on effects on evapotranspiration, and again this has been discussed in successive WG1 reports, and is mentioned in the SRCCL SPM with "medium confidence". Some aspects of regional climate change have been attributed to biophysical effects of land cover change on regional climate (via albedo and evapotranspiration) - see, for example, Christidis et al (2013) "The role of land use change in the recent warming of daily extreme temperatures", Geophysical Research Letters https://doi.org/10.1002/grl.50159. The effects of VOCs are less well-quantified. There is no text backing up this assertion which can be reviewed - section 7.3.2.5 is blank, and there is little else in the chapter. The placeholder for 7.3.2.5 refers to SRCCL and WG1 but those reports do not support the assertion made in this sentence of the Exec Summary. Page 42 lines 32-35 makes a statement which I believe to be correct from my own knowledge of the literature, but it does not back up the dismissive Exec Summary statement, and it only cites a single paper (Lewis et al 2019) which is missing from the reference list so the basis for the statement cannot be reviewed.	accept, we attracted a CA on albedo, VOC and physical effects	Richard Betts	Met Office Hadley Centre	United Kingdom (of Great Britain and Northern Ireland)
43157	3	20	3	21	here is a reference to biophysical but there is no text on this yet. we do know a lot, and we have learned more since SRCCL	accept, we attracted a CA on albedo, VOC and physical effects	Deborah Lawrence	University of Virginia	United States of America
47541	3	20	3	21	Whilst the overall net impact of the mentioned factors may remain unclear, their overall role and importance is very clear in many settings. The text should not pretend that these biophysical impacts are not understood. However, it is clear that country pledges mostly ignore them.	accept, we attracted a CA on albedo, VOC and physical effects	Zoltán Rakonczay	European Commission, Directorate General for Research	Belgium
9765	3	21	3	21	VOCs - do not use abbreviations: Volatil organic compound.	accept, we attracted a CA on albedo, VOC and physical effects	Jeanne Bormann	Ministry of agriculture	Luxembourg
28059	3	21	3	21	VOCs should be defined the firest time it is used before abbreviating	accept, we attracted a CA on albedo, VOC and physical effects	Alix Frank Rodrigue Idohou	National University of Agriculture	Benin
28937	3	21	3	21	Kindly add abbreviation for VOCs --> Vollatile Organic Compounds	accept, we attracted a CA on albedo, VOC and physical effects	Marissa Malahayati	National Institute for Environmental Studies	Japan
38893	3	21	3	21	the role of land use … please add '...and land use change'	accept, we attracted a CA on albedo, VOC and physical effects	francesco tubiello	FAO	Italy
39243	3	21	3	21	Volatile Organic Compound (VOC)	accept, we attracted a CA on albedo, VOC and physical effects	Roberta Zecchini Cantinho	UNDP / UnB	Brazil

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
10387	3	22	3	23	"Technologies …can be employed cost-effectively" - all of them? At what scale? What does cost-effective mean here - relative to a carbon price of $500/ton, or without a carbon price?	accept, we will elaborate in SOD	Andy Reisinger	NZAGRC	New Zealand
27245	3	22	3	23	"Technologies and measures" sounds odd, a reference to the land systems should also be made. A half-sentence like "but are associated with challenges" is required to introduce the following text.	partly accept, we will try, but space is limited	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
610	3	22	3	26	Among the main challenges to implement AFOLU related measures are also the social conflicts associated to related interventions, such as large-scale tree planations (associated to land grabbing), REDD+ (conflicts over access rights, distribution of benefits), forest conservation areas (associated to exclusions). There is a large body of literature emerging here (see further comments below). A main challenge is thus to support measures that are not only effective in terms of emission reduction potential, but also measures that are equitable and socially feasible. This is of key importance, as otherwise the related emergence of conflicts has not only important social justice and equity implications (relevant for the SDGs), but also hinder the development and thus the effectiveness of emission reduction projects. This should be highlighted too.	accept, we will try, but space is limited in exe sum	Arnim Scheidel	Institute of Environmental Science and Technology (ICTA), Autonomous University of Barcelona (UAB)	Spain
12169	3	22	3	26	Please consider to increase this paragraph to better reflect the challenges and barriers of the removal technologies. This would give a more holistic overview of the challenges for policy. In addition, please consider inlcude some information about the opportunities the technologies also can have in the future.	accept, we will try, but space is limited in exe sum	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
46145	3	22	3	26	Here, the technologies and measures to reduce emissions or to enhance removals could be mentioned and the ranges in Gt CO2 eq yr-1 provided	reject, various measures are given further below in exe sum	Daniel Ortiz-Gonzalo	Department of Geosciences and Natural Resource Management, Faculty of Science, University of Copenhagen	Denmark
46483	3	22	3	26	One of the challenges is the tradeoff with biodiversity, food security and Indigenous Peoples and other vulnerable populations who would be at increaesd vulnerability if their land is used for mitigation instead of livelihood, food and other uses. It is estimated that Indigenous People control 11% all forest, and higher proportion of tropical forests. While they have shown a higher likelihood of conservation compared to other groups, efforts at mitigation and protection could reduce their control and rights over forests and in turn their food security and livelihoods. Smallholder producers are another vulnerable group that is more likely to lose access to land if large-scale mitigation policies are enacted without taking their needs into account. See for example Corbera, E., Costedoat, S., Ezzine-de-Blas, D. and Van Hecken, G. (2020), Troubled Encounters: Payments for Ecosystem Services in Chiapas, Mexico. Development and Change, 51: 167-195. doi:10.1111/dech.12540	accept, we will try, but space is limited in exe sum. we have a trade offs section in main text.	Rachel Bezner Kerr	Cornell University	United States of America
47543	3	23	3	23	"cost-effectiveness" here and throughout shoudl be qualified. Like with many other sectors, some AFOLU measures can be cost effective up to a certain scale, but many are not and virtually all become very expensive beyond a certain scale.	accept, we will elaborate in SOD	Zoltán Rakonczay	European Commission, Directorate General for Research	Belgium
18	3	23	3	26	The challenges are not clear or do not sound like challenges, please rephrase. "	accept, we will improve sentence	Stella Kabiri-Marial	National Agricultural Research Organisation	Uganda
27247	3	23	3	26	revise sentence, not easy to understand.	accept, we will improve sentence	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
1849	3	24	3	24	measures …types' … ?	accept, we will improve sentence	Alka Bharat	Department of Architecture & Planning, M.A.National Institute of Technology (An Institute of National Importance),Bhopal (M.P.)	India
40367	3	26	3	26	also ecological	accept, we will improve sentence	Gunta Kalvane	University of Latvia	Latvia
17909	3	27	3	27	Modestly' is vague	accept, we will improve sentence	Luke Spajic	University of Adelaide (graduate student researcher), University of Oxford (visiting student researcher)	Australia
27249	3	27	3	28	The first part of the statement refers to the past, the latter part is unclear (as emissions continue: continue = will continue or continued? Also unclear: continue what?)	accept, we will improve sentence	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
47545	3	27	3	29	"contributed modestly to net mitigation": it is unclear from the underlying chapter whether it ihas contributed at all, or to what extent. If CO2 emissions have "remained constant", then any contribution "so far" would assume that in the absence of mitigation, net CO2 emissions from the sector would have increased (ro sinks would have declined). However, this is not shown here or anywhere in the text.	accept, we will improve sentence	Zoltán Rakonczay	European Commission, Directorate General for Research	Belgium
19927	3	27	3	30	"Globally, the AFOLU sector has so far contributed modestly to net mitigation as emissions continue to rise. CO2 emissions from AFOLU have remained more or less constant over the last 50 years with high uncertainty and no clear trend, while CH4 and N2O emissions have increased globally": contradiction: if CO2 was constant and N2O and CH4 increased then AFOLU did not contribute to net mitigation but it contributed to emissions.	accept, we will improve sentence	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
27251	3	29	3	30	statement ambiguous: with high uncertainty …. (high confidence). It means there is high confidence that uncertainties are high?	accept, we will improve sentence	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
1377	3	30	3	31	"in some regions and countries CO2 net emissions have gone down due to reduced rates of deforestation (e.g. Brazil, Indonesia)" - this statement rests on some inconsistent cherry-picking of dates. In Brazil deforestation/emissions have gone down in the medium term (e.g., post 2004 relative to pre-2004), but have gone up in the short term (e.g. post 2012 and especially post 2017). On the other hand, in Indonesia deforestation/emissions have gone up in the medium term (e.g. steadily since 2000) but down in the very short term (post 2017). More precision needed to the statement, and ideally consistency as well.	accept, we will improve sentence	Jonah Busch	Earth Innovation Institute	United States of America
25863	3	30	3	31	The observation regarding Brazil should be reconsidered due to the new governmental policies related to agriculture in the Amazonia (Amigo, 2020; 10.1038/d41586-020-00508-4). It is important to avoid giving a false impression on the severe deforestation that is currently occurring in the Brazilian Amazon. Thus, mentioning that until certain year these reductions were observed but after certain year this trend is no longer observable may be a good option to draw attention to the topic.	accept, we will improve sentence	Jorge Hoyos-Santillan	University of Magallanes	Chile
39615	3	30	3	31	net emissions have gone down due to reduced rates of deforestation (e.g. Brazil, Indonesia)' does this statement still hold given significant forest fore events occuring from about August 2019 onwards:the Brazilian Amazon fires which began around August 2019 and the Australian bush fores which started in Novemmber 2019	accept, we will improve sentence	Shobha Maharaj	Independent Consultant	Germany
39617	3	30	3	31	net emissions have gone down due to reduced rates of deforestation (e.g. Brazil, Indonesia)' - despite a reduction in deforestation within Indonesia, it might be worth elaborating on how much of this reduction has been related to decreased peat/mangrove conversion	reject, no space in exec summary for details	Shobha Maharaj	Independent Consultant	Germany
12159	3	30	3	33	The paragraph refers to increasing sinks in some regions. As always it will be important to distinguish between direct anthropogenic changes and natural responses to human-induced environmental change. Therefore, please consider to also include information about other effects caused by forest expansion in northern latitudes that might have contrasting effects (i.e. albedo), see also p 42 line 31-40 and the placeholder in ch 7.3.2.5	reject, no space in exec summary for details	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
18117	3	31	3	43	Remove policy-prescriptive formulations, express such findings in neutral language	reject, not prescriptive	Helmut Haberl	Institute of Social Ecology, University of Natural Resources and Life Sciences, Vienna	Austria
18113	3	33	3	33	How were the beneficial effects of bioenergy ascertained?	reject, no space here. see main text,	Helmut Haberl	Institute of Social Ecology, University of Natural Resources and Life Sciences, Vienna	Austria
27393	3	33	3	33	What are the "beneficial effects of bioenergy"? This expression is overly generic and potentially misleading. Needs to be sustained and detailled. In particular, the timing-effects of bioenergy as well as the opportunity costs need to be factored in at such a high aggregation level.	reject, no space here. see main text, and a coordination with ch 12 is taking place on bioenergy	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
46147	3	33	3	33	Are still the reduced rates of deforestation of "high confidence" for Brazil?	accept, we will improve sentence	Daniel Ortiz-Gonzalo	Department of Geosciences and Natural Resource Management, Faculty of Science, University of Copenhagen	Denmark
46149	3	33	3	33	"or beneficial effects e.g. from bioenergy (although accounted in energy sectors)". What about the competition for land?	reject, no space here. see main text, and a coordination with ch 12 is taking place on bioenergy	Daniel Ortiz-Gonzalo	Department of Geosciences and Natural Resource Management, Faculty of Science, University of Copenhagen	Denmark
21559	3	34	3	35	sould be write c….d…m…and then abriviation (CDM) same with ……(REDD)	accept , editorial	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
11257	3	34	3	38	Suggested to be quentfied how many ?	reject, no space here	Mahmood Riyaz	Maldivian Coral Reef Society	Maldives

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
16823	3	35	3	35	REDD+ is reduced emissions from deforestation and Forest degradation	accept , editorial	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
18115	3	35	3	36	vague formulations related to REDD+. I suspect there also have been failures. Aim at balanced statements	accept, we will improve sentence	Helmut Haberl	Institute of Social Ecology, University of Natural Resources and Life Sciences, Vienna	Austria
4915	3	37	3	37	"but" those benefits will emerge in the future	accept, we will improve sentence	Patrick Lamers	National Renewable Energy Laboratory	United States of America
1379	3	37	3	38	"those benefits will emerge in the future" this is speculative; should be removed	accept, we will improve sentence	Jonah Busch	Earth Innovation Institute	United States of America
31965	3	38	3	39	Trends in demand for food due to population and income growth, shifts towards greater meat consumption', I would say it is the opposite, people are trying to eat less meat	reject, overall consumption is going up.	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
19929	3	39	3	39	"high intensification with increased fertilizer use": suggest adding and reduced nitrogen use efficiency (see e.g. Lassaletta, L., Billen, G., Grizzetti, B., Anglade, J. & Garnier, J. (2014) 50 year trends in nitrogen use efficiency of world cropping systems: the relationship between yield and nitrogen input to cropland. Environmental Research Letters, 9, 105011.), as higher intensification in itself doesn't lead to increased emissions (only if more is produced and/or more resources are wasted)	accept, we will improve sentence	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
47547	3	41	3	41	The reference to "saturation" in the executive summary is not supported by the text, which neither discussed "saturation" to sufficient detail, nor shows that it would be reached anywhere. There is limited reference to sinks declining in certain regions, but it is clearly the result of a declining difference between harvests and growth, which is not the same as "saturation". Harvest can always be increased to exceed growth, which can always keep sink at or below zero, but it is not an indication of "saturation".	accept, we will improve main text	Zoltán Rakonczay	European Commission, Directorate General for Research	Belgium
4917	3	41	3	43	Good point, badly written	noted	Patrick Lamers	National Renewable Energy Laboratory	United States of America
22939	3	41	3	43	The statement "What we learn from the last 30 years…" is a complete lie. The only way to lower atmospheric CO2 is by increasing photosynthesis. Https://cctruth.org/residence_time.pdf	reject	Dave White	Climate Change Truth Inc.	United States of America
26835	3	41	3	43	The point of this sentence is not as clear as it should be. It may be better to say that emissions reductions in the AFOLU sector are required to achieve the goals of the Paris Agreement, but land cannot be the only source of emission reductions. Reductions of fossil fuel emissions are required and in the absence of these reductions, what is done on the land will be meaningless to solving the climate crisis.	accept, we will improve sentence	Louis Verchot	International Center for Tropical Agriculture	Colombia
27253	3	41	3	43	Statement is too generic. "There is no free ride" needs to be carefully defined. There are options that build upoen synergies (see Ch6 SRCCL, or the next para, for instance). Then: the problem is not binary: the question is not if there is a free ride or not, but the scale effects are key. Some options have low impacts at low levels, but impacts scale non-linearily in many cases. So, instead of "free ride": and is a sensible resource attached to many critical processes, directly and indirectly linked to human wellbeing.	reject, a clear statement is needed. the land sinks are too often seen as a simple way to compensate emissions elsewhere. and that is not true	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
38895	3	41	3	43	Please re-write for better use of english language	partly accept, maybe it can be improved	francesco tubiello	FAO	Italy
562	3	42	3	42	the expression "there is no free ride" may be too colloquial to be widely understood by non-native English speakers. I suggest changing to "it will be difficult for this sector…"	reject; it is a to the point statement	Pierre Bernier	Natural Resources Canada	Canada
1851	3	42	3	42	no free ….sectors' … ?	reject, unclear remark	Alka Bharat	Department of Architecture & Planning, M.A.National Institute of Technology (An Institute of National Importance),Bhopal (M.P.)	India
12051	3	42	3	42	Please consider to use another term than "free ride", for instance related to challenges about sustainable landuse.	reject; we are happy with a clear statement	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
16825	3	42	3	42	Better rewite: "What we have learnt in the last 30 years is that a 'free ride' is not possible in the context of this sector, as far as compensating emissions in other sectors is concerned"	reject; it is a to-the-point statement	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
40369	3	42	3	42	" there is no free ride" - sentence is incomprehensible.	reject; it is a to-the-point statement	Gunta Kalvane	University of Latvia	Latvia
16827	3	44	3	44	"have most chance" > "have the best chance"	reject; it is a to-the-point statement	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
32115	3	44	3	46	Is true that “Policies adapted to local circumstances have most chance of being successful…”, but the chance can be higher if the multilevel governance issues are properly addressed. So not only the horizontal coordination (“trade-offs and synergies with other services including food and fiber…”) but also the vertical coordination between several governance levels	accept, good point, but we have limited space in exe sum	Denis Jean Sonwa	CIFOR (Center for International Forestry Reseacrh)	Cameroon
44145	3	44	3	46	"Policies adapted to local circumstances, have the most …". Please include the article "the" illustrated in bold.	accept, editorial	Tshepiso Mafole	University of Cape Town	South Africa

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
1853	3	46	3	46	more novel policy' … specify	accept, we will elaborate when space allows	Alka Bharat	Department of Architecture & Planning, M.A.National Institute of Technology (An Institute of National Importance),Bhopal (M.P.)	India
1857	3	46	3	49	Reframe sentence ' More novel….feedstocks'	accept, editorial	Alka Bharat	Department of Architecture & Planning, M.A.National Institute of Technology (An Institute of National Importance),Bhopal (M.P.)	India
1855	3	47	3	47	optimal land managemet' …. Specify	accept, we will elaborate when space allows	Alka Bharat	Department of Architecture & Planning, M.A.National Institute of Technology (An Institute of National Importance),Bhopal (M.P.)	India
47549	3	47	3	49	"optimal land management" yielding "sustained benefit" is an attractive concept, but nowhere in the text is the nature of the "optimum" explained. No reference is made to forest yield functions or how mean annual increments could be optimised (e.g., for highest forest output, if that were to be the goal), or how the change in carbon and/or biomass stocks can be best compared with biomass yields (outputs) in the present or the long run and how the two could be optimised. In addition, "sustained" mitigation benefit implies a reasonably stable situation, whilst most of the measures discussed (and especially the ones identified as having major mitigation potentials) imply heavily dynamic situations with drastic departures from a steady-state.	accept, we will elaborate when space allows	Zoltán Rakonczay	European Commission, Directorate General for Research	Belgium
12135	3	47	3	51	This is an important statement in the summary that could be further elaborated in this chapter.	noted	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
38745	3		3		Not all scales are equal. If possible I would like to suggest that the authors mention the mitigation trade-offs with biodiversity and food security somewhere in the executive summary. Bottom-up mitigation plans are less normative, and safer than top-bottom mitigation efforts. E.g. The IPCC. Global Warming of 1.5 °C - SR15. 2018. warned that many of the proposed CDR practices imply the consumption of vast areas of land, energy, water and nutrients if deployed at the large scale. Particularly, afforestation and bioenergy may compete with other land uses and have significant impacts on agricultural and food systems, biodiversity and other ecosystem functions and services. There could be risks and adverse impacts on human communities, human and land rights as well as natural ecosystems and biodiversity if the CDR practices were deployed at large scales and on top of each other. E.g. Avoiding, reducing and reversing land degradation can contribute substantially to the mitigation of climate change, but land-based climate mitigation strategies must be implemented with care if unintended negative impacts on biodiversity and ecosystem services are to be avoided (well established) (IPBES 2018e).	reject, trade offs are mentioned, competition for land s mentioned . we will specify further	Adriana Mordente	United Nations Convention to Combat Desertification	Germany
612	3	44	4	1	It could be highlighted that policies must also adapt to local histories of land use and local understandings of equity in land use among different user groups in order to be more successful. Some general and specific references of unsuccessful projects because of overlooking local understandings: 1) Olwig, M.F., Noe, C., Kangalawe, R., Luoga, E., 2016. Inverting the moral economy : the case of land acquisitions for forest plantations in Tanzania. Third World Q. 6597. https://doi.org/10.1080/01436597.2015.1078231; 2) Scheidel, A., Work, C., 2018. Forest plantations and climate change discourses: New powers of 'green' grabbing in Cambodia. Land use policy 77, 9–18. https://doi.org/10.1016/j.landusepol.2018.04.057; 3) Lyons, K., Westoby, P., 2014. Carbon colonialism and the new land grab: Plantation forestry in Uganda and its livelihood impacts. J. Rural Stud. 36, 13–21. https://doi.org/10.1016/j.jrurstud.2014.06.002 4) Borras, Franco, J.C., 2018. The challenge of locating land-based climate change mitigation and adaptation politics within a social justice perspective : towards an idea of agrarian climate justice. Third World Q. 6597, 1–18. https://doi.org/10.1080/01436597.2018.1460592	thank you for references	Arnim Scheidel	Institute of Environmental Science and Technology (ICTA), Autonomous University of Barcelona (UAB)	Spain

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
18119	3	44	4	2	There are tradeoffs between maximizing C stocks in biota and soils and maximising extraction of food, feed, timber and biomass feedstocks. In my view it is very important to be crystal clear about those tradeoffs. Formulations are sloppy and vague, e.g. it is not very helpful that some activities may be expensive and others cheap - which ones fall in which category?	reject, there are not always trade offs in somewhat longer term . we expressed here that a balance can be found. we don't say that both can be at their maximum (stocks in forest and extraction) . we will specify the costs aspects better	Helmut Haberl	Institute of Social Ecology, University of Natural Resources and Life Sciences, Vienna	Austria
43949	3	44	4	2	Coordination with WGII chapters such as 2, 5, regional chapters as well as development of a Cross Working Group Box on Food Systems should be investigated.	accept, a food cross chapter group has ben set up. also a cross WGII - III group has been set up.	Hans Poertner and Elvira Poloczanska	Alfred-Wegener-Institut	Germany
11259	3	1	5	3	Not sure if the narative that want to deliver from the chapter is very clear, paragraph to paragraph connectivity is not much there is no flow	accept, exe sum can be improved	Mahmood Riyaz	Maldivian Coral Reef Society	Maldives
28767	3	1	5	3	It seems executive summary is too long more than 2 pages, for a better understanding it would be better to summary in one page.	reject, many reviewers ask to be more specific and have more details	Alireza Yazdani	Shiraz University	Iran
14227	3	1	5	4	The chapter is missing a key finding, which is the uncertainty of the land sink in emissions scenarios that feature a large scale of carbon removal. See: Hewitt, A. J., Booth, B. B., Jones, C. D., Robertson, E. S., Wiltshire, A. J., Sansom, P. G., ... & Yip, S. (2016). Sources of uncertainty in future projections of the carbon cycle. Journal of Climate, 29(20), 7203-7213. and Keller, D. P., Lenton, A., Littleton, E. W., Oschlies, A., Scott, V., & Vaughan, N. E. (2018). The effects of carbon dioxide removal on the carbon cycle. Current climate change reports, 4(3), 250-265. The IAMs suggest weakening of the land sink in the pathways after atmospheric concentrations decrease (see Jones, C. D., Ciais, P., Davis, S. J., Friedlingstein, P., Gasser, T., Peters, G. P., ... & Jackson, R. B. (2016). Simulating the Earth system response to negative emissions. Environmental Research Letters, 11(9), 095012). In some scenarios land becomes a source of emissions (see. the land-sink in the SSP2-AIM RCP1.9).	accept, it is good references. to be included. however, the natural sink is not part of this chapter, it is the AFOLU (= managed) part	Aljoša Slameršak	The Institute of Environmental Science and Technology (ICTA-UAB)	Spain
3225	3	2	5	3	It is suggested to build on the Special Report Land and its Summary for Policy Makers. Avoid to reinvent the wheel and avoid that there are two IPCC assessments on the same topic with different findings unless justified by literature that has not been considered in the er5alier Special Report Land.	accept, this is exactly what we do. some repetition of statement s for SRCCL is unavoidable	Klaus Radunsky	retired from Umweltbundesamt	Austria
3227	3	2	5	3	The quality of the language is poorer compared to the chapters 1 to 6. It is strongly recommended to reword with the help of native English speakers.	accept, editorial	Klaus Radunsky	retired from Umweltbundesamt	Austria
3229	3	2	5	3	Unfortunately the statements included in the executive have not been linked with the underlying text of the subchapters. It is very important to establish such traceability.	accept, will be done in SOD	Klaus Radunsky	retired from Umweltbundesamt	Austria
3169	3	4	5	3	Please indicate the Section(s) referenced for each of the paragraphs.	accept, will be done in SOD	Sai Ming LEE	Hong Kong Observatory	China
27241	3	4	5	3	The flow of the ES should be revised. Suggestion: start with general, big statements, put details later. For example, first bullet point: I agree that the need and options for CC mitigation are key in particular in Ch7, this is not a strong starting statement, indeed rather confusing if it is put there without context. Furthermore, the statement is too generic, the link between mitigation and growring pressures needs to be made with an explicit statement. Important also because not all mitigation activities induce pressures, see SRCCL ch6. My suggestion would be to start from the ES of Ch11 of AR5 and add new findings from there.	accept partly, we will improve the ES	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
11263	3	19	5	32	NDC figure in ES 25% page 3 line 19 and the same NDC figure in page 5 line 32 is 30% these figures has to be consistance	accept, we will harmonise	Mahmood Riyaz	Maldivian Coral Reef Society	Maldives
25745	3	19	5	32	On these two lines (3-19 & 5-32), different numbers are stated for the contribution of AFOLU to NDCs	accept, we will harmonise	Helen Hughes	University of Edinburgh	United Kingdom (of Great Britain and Northern Ireland)
44943	3	1	101	15	The chapter lacks a focus on climate justice aspects of forest-based climate mitigation in the Global South in comparison with emission cuts from production and consumption in the global North.	Noted thank you. Efforts have been made to address this	Hanne Svarstad	OsloMet - Oslo Metropolitan University	Norway
38741	3		129		FertiliSer or FertiliZer. The two formats are being used throughout the document.	accept, editorial	Adriana Mordente	United Nations Convention to Combat Desertification	Germany
12029	3	0			Please consider including in the Executive Summary that land mitigation potential is constrained due to land availability. This is a key message from the IPCC SRCCL report and highly relevant for the WGIII report aswell	accept partly, we do mention pressure on land, competition for land on page 4.	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
10379	3	2			The ES has no line of sight to the underlying sections, plus this is almost the only place where confidence language is used, making it almost impossible to trace the justification of confidence back to the assessment within the body of the chapter. Also, wording is often policy prescriptive or too qualitatively vague to convey clear meaning (e.g. "expectation on land to deliver mitigation is very high" - whose expectation, what does 'high' mean, compared to what expectation in other sectors?; or "AFOLU has contributed modestly to net mitigation" - what does modest mean, compared to what reductions in other sectors, compared to which costs, etc?; "policies adapted to local circumstances have most change of being successful" - this is a common place statement without drawing on specific insights from the AFOLU sector - it is true for any policy on any issue). I was also expecting an effort in this chapter to compare and contrast the technical mitigation potential with real-world outcomes, feasibility, constraints and opportunities - but there is no statement on this in the ES and no section (that is forward looking) in the underlying chapter.	accept, we have made improvements in SOD	Andy Reisinger	NZAGRC	New Zealand

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
1371	3	4			expectation *of whom?*	reject, this is clear from NDC, that a lot is expected from land , as well as from increasing food demand, increasing need for renewables. we will improve text	Jonah Busch	Earth Innovation Institute	United States of America
22519	3	5			Perhaps change to dietary changes and omit “impacts of”. Pressures on land have grown with population, dietary changes, climate change, and…	accept, editorial	Melissa Lucash	Portland State University	United States of America
21557	3	6			please mention other land uses, make more specific	reject, clear what other land use s are: urban, infrastructure etc.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
5899	3	7		17	Disappointing that not even the Exec Summary has been proof read prior to circulating for review. This detracts from concentrating on the content.	accept, editorial	Ralph Sims	Massey University	New Zealand
1373	3	7			again, expectation *by whom?*	reject, this is clear from NDC, that a lot is expected from land , as well as from increasing food demand, increasing need for renewables. we will improve text	Jonah Busch	Earth Innovation Institute	United States of America
1375	3	10			that AFOLU is "the only sector for which it is currently feasible to enhance removals at scales…" is a critically important point. This point is lost when total global sources of GHGs are portrayed using a pie chart, as has been the case in previous Assessment Reports (e.g. Figure 1.7 "Greenhouse Gas Emissions by Economic Sectors", p47 Synthesis Report of IPCC AR5). IPCC should instead present emission sources using a bar chart, with sources arranged in descending order from left to right (as opposed to stacked). Because a bar chart can show both positive and negative valuess, it is able to show the potential for net AFOLU emissions to be reduced *below zero* (i.e, to become a net sink), which is not the case for other sectors. Because I'm not able to attach a figure, I provide here a link to an illustrative figure: https://twitter.com/jonahbusch/status/1215711770389565440?s=20. Note that this comment is in relation to the eventual synthesis report rather than Chapter 7 per se, but I don't know where else to transmit this comment.	accept, we cannot include a graph here in exe sum as reviewer mentions himself. good point for main text and tech summary	Jonah Busch	Earth Innovation Institute	United States of America
38079	3	10			"scales that can SIGNIFICANTLY contribute to carbon neutrality"	accept	Craig Jamieson	Straw Innovations Ltd	Philippines
22525	3	11		12	How about rewriting this to be: AFOLU stores a large amount of carbon, and is both a source and sink of GHG emissions. Globally, it is a source of 23% of total GHG emissions providing 14% of total CO2, 44% of CH4 and 88% of N2O anthropogenic CO2 emissions during 2007-2016. It is also a sink of C, accounting for about 29% of anthropogenic CO2 emissions. Global tree…”	accept, we will improve the sentence	Melissa Lucash	Portland State University	United States of America
731	3	11			Remove "of important driver"	accept, we will improve the sentence	Rémi CARDINAEL	CIRAD	France
12665	3	11			The percentage (%23) also should be given separately as Agriculture and LULUCF.	accept, we will improve the sentence	Eray Özdemir	General directorate of Forestry	Turkey
22521	3	11			Why do you need “of important driver”? It’s a little awkward and could be omitted. Do you mean total for the 23% because then you switch to CO2.	accept, we will improve the sentence	Melissa Lucash	Portland State University	United States of America
27893	3	11			Citation for GHG emission % is missing	accept, we will improve the sentence	Gajanan Kothawade	Washington State University	United States of America
22523	3	12			“The latter” is not a sentence.	accept, we will improve the sentence	Melissa Lucash	Portland State University	United States of America
43153	3	12			needs a verb	accept, we will improve the sentence	Deborah Lawrence	University of Virginia	United States of America
35103	3	14			of N2O instead of N2O	accept, we will improve the sentence	Happiness Nnko	The University of Dodoma	United Republic of Tanzania
43155	3	15			other sources' refers to what? is it in contrast to trees?	accept, we will improve the sentence	Deborah Lawrence	University of Virginia	United States of America
22527	3	19			Add through, as in “primarily through reduced…” and “changes in agricultural practices” rather than agricultural measures, which is vague.	accept, we will improve the sentence	Melissa Lucash	Portland State University	United States of America
12667	3	20			afforestation, restoration of degraded forests and some agricultural measures	accept, we will improve the sentence	Eray Özdemir	General directorate of Forestry	Turkey
22529	3	20			Change to: “How these proposed changes will affect albedo…”	accept, we will improve the sentence	Melissa Lucash	Portland State University	United States of America
27895	3	20			Please mention few measure when you refere some agricultural measures.	accept, we will improve the sentence	Gajanan Kothawade	Washington State University	United States of America
5901	3	21			Many readers won't understand the acronyms such as VOCs - put in full first time	accept, we will improve the sentence	Ralph Sims	Massey University	New Zealand
733	3	23			Main challenges also include lack of access to markets, inputs, especially for smallholder farmers in SSA, but also issues related to land tenure	accept we will consider, given lack of space	Rémi CARDINAEL	CIRAD	France
43159	3	23			if considered 'cost effective' why is there so little; mention the need for compliance mechanisms and/or markets	accept we will consider rewrite, given lack of space	Deborah Lawrence	University of Virginia	United States of America
22531	3	26			Change to “forces that oppose…” and aspects could be clarified. Perhaps infrastructure?	accept we will consider rewrite, given lack of space	Melissa Lucash	Portland State University	United States of America

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
43913	3	27		43	The writing and messaging in the executive summary should be brought in line with the messaging of the 1.5 C report to maintain consistency across reports.	accept we will consider rewrite, given lack of space	Hans Poertner and Elvira Poloczanska	Alfred-Wegener-Institut	Germany
17755	3	30		31	Please provide values of this reduced rates of deforestation in Brazil and Indonesia taken as examples.	reject, not here in exe sum	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
5903	3	31			Need to update the Brazilian situation - this statement no longer correct. At least quote year:	accept, we will rewrite to reflect current trends	Ralph Sims	Massey University	New Zealand
22533	3	33			Why do you separate out “beneficial effects” when they are part of the “emissions going down”? It’s not clear what you mean by “although accounted…”. Maybe that could be clarified or omitted.	accept, we will improve the sentence	Melissa Lucash	Portland State University	United States of America
43161	3	33			bioenergy is not usually considered/counted/accounted under land sector; some frameworks (IAMs? UNFCCC?) do not attribute bioenergy to land but rather to energy sector. Are you proposing something totally different here?	unclear, this is what we state 'bioenergy is accounted under energy sectors'	Deborah Lawrence	University of Virginia	United States of America
16493	3	35			Under REDD+, (attention to plus), forest management should be mentioned and highlighted and past activities should be evaluated.	reject , we follow official definition	Mostafa Jafari	Head of TPS for LFCCs/ and IPCC LA	Iran
22535	3	37			Need a semicolon or period before “those benefits”.	accept, editorial	Melissa Lucash	Portland State University	United States of America
1381	3	39			"high intensification with increased fertilizer use" might be expected to lead to more emissions from LU, but less emissions from LUC, and probably less emissions on net	accept, we need to clarify this, and build it upon the chapter main text	Jonah Busch	Earth Innovation Institute	United States of America
22537	3	39			Change to high “agricultural” intensification.	accept, we need to clarify this, and build it upon the chapter main text	Melissa Lucash	Portland State University	United States of America
22539	3	40			Change to “while other areas show signs of sink saturation”.	accept, we need to clarify this, and build it upon the chapter main text	Melissa Lucash	Portland State University	United States of America
43163	3	40			will instead' language goes way back to earlier in paragraph; remake the explicit contrast here or hard to follow	accept, editorial	Deborah Lawrence	University of Virginia	United States of America
22541	3	41			Change to “what we have learned”	accept, we need to clarify this, and build it upon the chapter main text	Melissa Lucash	Portland State University	United States of America
43165	3	41			saturation? Where/how?	accept, we need to clarify this, and build it upon the chapter main text	Deborah Lawrence	University of Virginia	United States of America
43167	3	42			more explicit? Less colloquial?	reject, it is clear sentence	Deborah Lawrence	University of Virginia	United States of America
5905	3	50			By stating "lands" do you really mean soils?	no, this is not what we mean. apparently this raises questions. improve sentence	Ralph Sims	Massey University	New Zealand
34819	4	1	4	50	Some of exercutive summary sentences requires substantial editting. The sentences should be carefuly prunned and rewritten	accept, section will be improved	Onema Adojoh	Missouri University of Science and Technology, Rolla, USA	United States of America
236	4	3	4	3	specify how much represent 30% would represent in Gt CO2 in order to put in perspective the 7.8 Gt CO2 achieved so far	accept, section will be improved	Diego Morgavi	INRAE	France
19931	4	3	4	4	The reader would benefit from knowing how much emissions did the sector produce over the same 30 years period (to be able to put the 7.8 Gt CO2e reduction in context). Also, it might be worth clarifying that this is not a net reduction from the sector, but avoided emissions and increased sequestration (i.e. the net emisions still increased, as stated in the paragraph on p3 line 27).	accept, section will be improved	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
38897	4	3	4	4	I have not yet read the relevant section, however the statement that past policies have favoured mitigation at the tune of roughly 8GtCO2eq in 30 years is raising a flag	noted	francesco tubiello	FAO	Italy
10389	4	3	4	5	Give a sense of scale - is 7.8 Gt a big or small number compared to the total mitigation outcome (how do we know)? What does "encouraged" mean - have they caused the mitigation to happen that would not have happened otherwise, or did policies merely pull in the same direction as outcomes that would have happened anyway?	accept, section will be improved	Andy Reisinger	NZAGRC	New Zealand
17911	4	3	4	5	Current wording is unclear whether 30% mitigation of AFOLU or 30% of total global mitigation needed	accept, section will be improved	Luke Spajic	University of Adelaide (graduate student researcher), University of Oxford (visiting student researcher)	Australia
18625	4	3	4	5	The statement that 30% of the mitigation efforts needed for 2C should be done through measures in the AFOLU sector is in contrast with the stated 25% in NDCs on p7-3 line 18-19. In addition, on p7-5 line 32-33, it is stated that 30% of mitigation is pledged from AFOLU in NDCs. Is there consensus on the exact figure? If not, best to add a range?	accept, section will be improved	Charlotte Janssens	KU Leuven	Belgium
5063	4	3	4	7	Intergovernmental contributions in different forms such as launching projects would be a significant measure in AFOLU mitigation specially in developing countries. For example the Japan International Cooperation Agency (JICA) has launched a project in southwest Iran to establish forests and resuscitate pastures in Karun catchment in Iran in January 2019. (http://www.iran-daily.com/News/236968.html)	noted, thanks for the case	Sayed Masoud Mostafavi Darani	Iran Meteorological Organization	Iran
22941	4	3	4	13	We need to transfer the $400 billion annual wasted on false emissions work and put it into increasing photosynthesis	noted	Dave White	Climate Change Truth Inc.	United States of America
564	4	4	4	4	what does the 30% refers to?	accept, section will be improved	Pierre Bernier	Natural Resources Canada	Canada
19933	4	4	4	5	"needed to achieve 30% of the mitigation necessary to meet a 2 degree temperature threshold.": slightly confusing, it suggests we want to achieve only 30% of the mitigation (i.e. not all) what is needed to the 2C	accept, we will improve, the 30% is the share of afolu in total mitigation	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
37441	4	5	4	5	It would be useful here to have a figure that relates to the 1.5°C temperature limit now being pursued under the PA. Use of the word threshold is directional and confusing for that reason - can there be a reference to a temperature limitation likelihood (but see comments to chapter 3 and misleading categorization of scenarios C3 & C4 when linked to PA)	partly accept, the overall mitigation pathways are also part of ch 2 and 3. we will relate to them	Michiel Schaeffer	Climate Analytics	Netherlands
25747	4	5	4	7	Consider comparing direct-direct funding across geographies? The current comparison seems a bit 'apples and oranges'.	accept, section will be improved	Helen Hughes	University of Edinburgh	United Kingdom (of Great Britain and Northern Ireland)
12195	4	5	4	9	Sentence is not clear, more funding is required? The share (1billion) for developing countries compared to global seems small.	accept, section will be improved	Mohammad Ibrahim Khalil	University College Dublin	Ireland
19683	4	6	4	8	is it true that funding availability vs needed are 1 bio vs 400, respectively?	accept, section will be improved	Mochamad Indrawan	Research Center for Climate Change - Universitas Indonesia (RCCC-UI)	Indonesia
46151	4	8	4	8	"This amounts to is only a small share..."	accept, section will be improved	Daniel Ortiz-Gonzalo	Department of Geosciences and Natural Resource Management, Faculty of Science, University of Copenhagen	Denmark
25749	4	9	4	9	Are these policies proven successful or theoretically successful?	Noted, and partly accept. we need to carefully relate this back to literature. and to main text	Helen Hughes	University of Edinburgh	United Kingdom (of Great Britain and Northern Ireland)
1385	4	9	4	12	The measures listed here are probably the ones most currently in vogue with advocacy organizations, but they are *not* the ones that are most successful on the basis of peer-reviewed evidence. Establishing tenure rights, community forestry, and forest certification are ambiguous as to their effect on deforestation, despite prominent advocacy campaigns in support. Two of the most consistently beneficial measures for forests, protected areas and support for the rights of Indigenous peoples, are not mentioned here. They should be. See e.g. Busch and Ferretti-Gallon 2017, meta-analysis of what drives deforestation and what stops it, which is cited lower down.	Noted, and partly accept. we need to carefully relate this back to literature. and to main text	Jonah Busch	Earth Innovation Institute	United States of America
43169	4	9	4	13	successful policies list should include conservation/protected areas as one policy	Noted, and partly accept. we need to carefully relate this back to literature. and to main text	Deborah Lawrence	University of Virginia	United States of America
42693	4	12	4	13	In addition to funding, the success of different policies is dependent on numerous factors including governance, institutions and the specific policy setting. I feel the sentence reads better this way.	Noted, and partly accept. we need to carefully relate this back to literature. and to main text	Eromose Ebhuoma	University of South Africa	South Africa
27255	4	13	4	43	First statement needs care: was it really policy driving the mitigation? Needs to be substantiated, which policy, where, etc. It seems a large part of the mitigation came as a co-product of industrialization, not from policy interventions as suggested, e.g. the return of the forests in the norhtern hemisphere. See eg. Gingrich et al., 2019 doi 10.1016/j.cosust.2019.04.005,	Noted, and partly accept. we need to carefully relate this back to literature. and to main text	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
18121	4	14	4	16	There are also scenarios with little need for BECCS and limited need for afforestation, e.g. the LED scenario by Grubler et al., 2018 (Nature Energy). The key question is, to what extend demand-side potentials can be mobilized (see ch5, this report)	reject, we consider the portfolio of afolu	Helmut Haberl	Institute of Social Ecology, University of Natural Resources and Life Sciences, Vienna	Austria
40325	4	14	4	21	In fact, that is not true. Chapter 3 highlights that ambitious scenarios that mitigate for 1.5°C without overshoot actually reduce reliance on CDR (because they do not count on returning to lower temperatures after an overshoot). Hence it is rather the lower-ambition scenarios that rely on BECCS and other CDR technologies.	reject, we don't read this in ch 3. it says' the predominance of CDR technologies...' etc	Linda Schneider	Heinrich Boell Foundation	Germany
92	4	14	4	22	The fact that CDR is mentioned here,it could be assumed the afforestation is a CDR option. Afforestation is also a mitigation strategy. It would be good to cliarify the distinction between mitigation and CDR in the introduction of this chapter	partly accept, see also glossary	Govindasamy Bala	Indian Institute of Science	India
10391	4	14	4	22	please coordinate with chapter 3 on this. It would be good to have a more nuanced statement that clarifies that IAMs generally only know about a subset of the mitigation options covered in this chapter, and provide a sense for what the conclusions of this chapter mean for land-demand in the real world. Are the land-use changes indicated concurrent or in alternative scenarios, and what does this depend on?	partly accept, this is for main text, here space is limited	Andy Reisinger	NZAGRC	New Zealand
17913	4	14	4	22	Not strong or specific enough about potential trade offs of reliance on bioenergy, or fact that bioenergy might not be carbon neutral	reject, but in SOD we will better specificity, also side effects	Luke Spajic	University of Adelaide (graduate student researcher), University of Oxford (visiting student researcher)	Australia

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
37839	4	14	4	22	This paragraph reads more like a review of the IAM literature than an assessment. The high confidence assigned to the heading seems to suggest that the numbers that follow deserve that categorization as well. But is the value indicated by IAMs for potential mitigation of 14.9 GtCO2 yr-1 for BECCS within a range that we can reasonably expect to be able to implement, especially if in the context of sustainable development? This contrasts with the statement to be found a few lines later (Lines 29-30) saying that "bioenergy can substitute in the energy sector between 2.8 and 7 GtCO2yr-1". This is at best 50% of the value indicated by IAMs (although it's not clear whether this range only includes substitution effects but not sequestration). If this lower potential is the result of bottom up sectoral analyses then it should explicitly balance the IAM potential. This is important because IAMs tend to favour BECCS for reasons other than its intrinsic value. Model structure and assumptions drive BECCS deployment such as the choice of discount rates as shown by Emmerling et al (https://iopscience.iop.org/article/10.1088/1748-9326/ab3cc9/meta) and more generally by Gambhir et al (https://www.mdpi.com/1996-1073/12/9/1747) among others, but also about what the models do NOT include in their technology portfolios and policy options as I showed in a recent review (https://link.springer.com/article/10.1007/s40518-019-00142-3). I think it is important to assess to what extent BECCS deployment projected in IAMs is reasonable given the actual realities of the AFOLU sectors. Assiging high-confidence to the IAM results just because the models agree misses the point that the paradigms underpinning these models are not as diverse as they may seem. For example, because most published scenarios have BECCS as the only CDR option (besides afforestation), any needed CDR ends up coming from BECCS but as Realmonte et al show (https://www.nature.com/articles/s41467-019-10842-5?stream=top) once other options are introduced, in this case DACCS, BECCS deployment goes down. Please take this opportunity to assess this literature rather than just reviewing it. If there is a place where the BECCS value in IAMs can be compared to real-world potentials, I would think it would be in this chapter (and also for links to other sectors in Ch 12, so coordination may be good here).	partly accept, this is for main text, here space is limited	ALEXANDRE KOBERLE	COPPE/UFRJ	Brazil
37841	4	14	4	22	This paragraph could be moved down two paragraphs and begin at current line 47 after the statement "Mitigation options have to consider different development aspirations and pathways mediated by drivers and enabling conditions as well as new finance mechanisms." Chapter 7 is a sectoral chapter and I suggest the sectoral bottom up assessments be given higher prominance than the top-down results from IAMs (which will be covered in more detail in Ch 3 anyway). I am not by any means suggesting that IAM scenarios be downplayed or ignored, but it would be more appropriate to assess their results in light of the bottom-up sectoral assessments. So, the 3 paragraphs in question could follow a logic of i) sector analysis shows xyz is possible (in the short- to medium-term) such as the 2-7 GtCO2/yr BECCS potential, but ii) these estimates are subject to regional and opportunity cost challenges with synergies and trade-offs with other societal objectives, and then iii) that IAM scenarios meeting Paris objectives indicate median of 14.9 GtCO2/yr which is higher/lower than sectoral estimates indicate and are at least partly driven by model structure and assumptions (see my previous comment).	accept, we will reflect on both top-down and bottom up assessments better in SOD. and make an overall assessment	ALEXANDRE KOBERLE	COPPE/UFRJ	Brazil
39245	4	16	4	16	SSP = Socio-Economic Pathways?	accept, editorial	Roberta Zecchini Cantinho	UNDP / UnB	Brazil
46153	4	16	4	16	First time the SSPs acronym is used. Mention Shared Socioeconomic Pathways (SSPs).	accept, editorial	Daniel Ortiz-Gonzalo	Department of Geosciences and Natural Resource Management, Faculty of Science, University of Copenhagen	Denmark
18627	4	16	4	17	Should the abbreviations of SSP and BECCS be written out in full first time mentioned?	accept, editorial	Charlotte Janssens	KU Leuven	Belgium
25751	4	16	4	17	Unclear whether the value stated is a median or a maximum ("reaches up to")	accept, will clarify	Helen Hughes	University of Edinburgh	United Kingdom (of Great Britain and Northern Ireland)
27979	4	16	4	18	IPCC states, "As a median value across SSPs and IAMs, required Carbon Dioxide Removal (CDR) reaches up to -14.9 GtCO2 yr-1 for BECCS and -2.4 GtCO2 yr-1 for afforestation in 2100." However a recent review and paper each find that synthetic CDR (which includes BECCS) does not work and/or represents an opportunity cost: Sekera, J., and A. Lichtenberger, The carbon capture conundrum: Public need versus private gain, A public policy perspective on carbon dioxide capture, 2020, https://drive.google.com/file/d/1K-BIULOUtfSs5LVCS9ONaDzq7jeFmO-b/view. They conclude (1) many scientific studies pass synthetic carbon removal methods off as "climate mitigation" when in reality the methods in play today increase CO2 and (2) laws subsidizing carbon capture and direct air capture increase CO2. Similarly, Jacobson, M.Z., The health and climate impacts of carbon capture and direct air capture, Energy and Environmental Sciences, 12, 3567-3574, doi:10.1039/C9EE02709B, 2019 similarly found that CCS/U and DACCS/U (including BECCS) are both opportunity costs resulting in hardly any CO2 reduction, even before considering the disposition of CO2, and air pollution and mining increases. This summary explains why BECCS is an opportunity cost thus will drive up CO2 compared with alternatives: https://web.stanford.edu/group/efmh/jacobson/Articles/I/BiomassVsWWS.pdf. Please caution against the use of synthetic CDRs, including BECCS, as there is no evidence they serve any benefit whatosever.	reject: DAC and CCS is part of ch 3. also we cannot refer to the grey stanford.edu website	Mark Jacobson	Stanford University	United States of America

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
39247	4	17	4	17	Bio-energy with carbon capture and storage (BECCS)	accept, editorial	Roberta Zecchini Cantinho	UNDP / UnB	Brazil
47551	4	20	4	21	It is not clear why it is implied that bioenergy crops would need to supply this bioenergy (e.g., instead of forests), what crops they would be and what yields would be assumed.	reject, details will be in main text	Zoltán Rakonczay	European Commission, Directorate General for Research	Belgium
10393	4	23	4	39	I would encourage a separate treatment of A and FOLU mitigation options and potentials, plus a statement on interactions between those (locally and globally - in the sense that less A mitigation means higher carbon prices to achieve a given temperature goal, which means higher pressure on FOLU sequestration, which feeds back on land used for A). Also please provide costs alongside potentials otherwise they are not useful for policy (or are the potentials technical potentials - which is a useful boundary criterion but even less helpful for policy)?	accept partly, section will be improved. however space is limited, details will remain in main text	Andy Reisinger	NZAGRC	New Zealand
22943	4	23	4	39	We stop deforestatiuon of the Amazon rain forest and in 3 years we gat back 80 gtyr-1 in sequestration. https://actascientific.com/ASAG/pdf/ASAG-03-0393.pdf	reject, vague grey literature	Dave White	Climate Change Truth Inc.	United States of America
33123	4	23	4	39	Agriculture in wetlands both permanent and seasonal is significant in tropics and contribute GHGs. These facts are missing in this section.	accept, if space allows	George Gatere Ndiritu	University	Kenya
14745	4	23	4	47	There should also be a mention of mitigation co-benefits of climate change adaptation technologies. As some adaptation options have direct or indirect mitigation benefits	accept, will improve section	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
43173	4	26	4	30	all numbers should have ranges and/or ± standard deviation	Noted. All values will be reviewed	Deborah Lawrence	University of Virginia	United States of America
26837	4	27	4	27	It may seem semantic, but this should be peatland restoration, not peat restoration. Peat is the soil, and it is the ecosystem that needs to be restored. You may also add mangrove restoration to this list	accept, editorial	Louis Verchot	International Center for Tropical Agriculture	Colombia
3173	4	28	4	28	There is a change in unit from GtCO2yr-1 to PgCO2yr-1 , which is unnecessary. Please consider revision.	accept, editorial	Sai Ming LEE	Hong Kong Observatory	China
4919	4	28	4	28	unit consistency (Pg = Gt)	accept, editorial	Patrick Lamers	National Renewable Energy Laboratory	United States of America
10575	4	28	4	28	"Total 9.9 Pg CO2yr-1". 'Pg' is not used in the chapter, should be 'Gt'	accept, editorial	Wen Zhang	Institute of Atmospheric Physics, Chinese Academy of Sciences	China
13151	4	28	4	28	Units from Gt CO2 to Pg CO2 in the same line. Maybe choose for consistancy and change Pg to Gt?	accept, editorial	Johan de Jong	Wageningen University & Research	Netherlands
19937	4	28	4	28	"9.9 Pg CO2 yr-1": would be more consistent with the rest of the text if given in Gt not Pg	accept, editorial	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
37843	4	28	4	28	Why the sudden shift from GtCO2 to PgCO2? Stick to Gt units.	accept, editorial	ALEXANDRE KOBERLE	COPPE/UFRJ	Brazil
27257	4	28	4	30	This statement is misleading. Partly overlapping can mean anything, but it suggest that bioenergy is associated with reforestation. First, dedicated energy crops prevent and thus compete with reforestation. Second, the use of wood products for energy is reducing the steady-state carbon stored in forests. These topics are very contested with many vested interested in different (stakeholder and shareholder) groups, thus finding concise, correct and non-tendentious expressions is very important.	partly accept, we will refine wording	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
18123	4	29	4	30	In what sense is bioenergy "partly overlapping" with reforestation? Indeed, bioenergy expansion and afforestation may compete for the same land area, and hence there are tradeoffs between trying to accumulate as much C in biota and soils as possible vs. trying to produce as much biogenic C for energy (and potentially BECCS). See e.g. Haberl, 2015. Ecol. Economics, 119, 424-431, doi: 10.1016/j.ecolecon.2014.10.002, Kalt et al., 2019 Global Change Biology Bioenergy 11, 1283–1297. doi: 10.1111/gcb.12626 and Kalt et al. 2020, Env Res. Lett. https://doi.org/10.1088/1748-9326/ab6c2e	reject, it is not a 'versus' it is a matter of trying to find the complementarities between reforestation and bioenergy options. in that sense they also overlap, as bioenergy will also be yielded from the reforestation activities	Helmut Haberl	Institute of Social Ecology, University of Natural Resources and Life Sciences, Vienna	Austria
27981	4	29	4	30	IPCC states, "Partly overlapping with the re-/afforestation results, bioenergy can substitute in the energy sector between 2.8and 7 GtCO2yr-1." This statement ignores the social cost of bioenergy due primarily to air pollution: Jacobson, M.Z., Effects of ethanol (E85) versus gasoline vehicles on cancer and mortality in the United States, Environ. Sci. Technol., 41 (11), 4150-4157, doi:10.1021/es062085v, 2007; Jacobson, M.Z., Review of solutions to global warming, air pollution, and energy security, Energy & Environmental Science, 2, 148-173, doi:10.1039/b809990c, 2009; Ginnebaugh, D.L., J. Liang, and M.Z. Jacobson, Examining the temperature dependence of ethanol (E85) versus gasoline emissions on air pollution with a largely-explicit chemical mechanism, Atmos. Environ., 44, 1192-1199, doi:10.1016/j.atmosenv.2009.12.024, 2010. Please specify this side effect of bioenergy with reference.	accept, we will refine the text on bioenergy to cover all aspects	Mark Jacobson	Stanford University	United States of America
43175	4	29	4	30	address these carefully in the later sections and more carefully here	accept, we will refine the text	Deborah Lawrence	University of Virginia	United States of America
3049	4	30	4	32	Can some estimate be placed on potential for reduced food loss & waste here? Would be useful in terms of relative magnitudes.	accept, we will refine the text	Dave Reay	University of Edinburgh	United Kingdom (of Great Britain and Northern Ireland)

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
17915	4	30	4	32	Vague about necessity of diet shift for achieving 2 degree targets, which is mentioned later on. Could mention that current dietary guidelines are incompatible with Paris agreement, or the specific mitigation potential of dietary change as detailed in special report on land or diet section (up to 7.7 or 8 Gt/ year)	accept, we will refine the text	Luke Spajic	University of Adelaide (graduate student researcher), University of Oxford (visiting student researcher)	Australia
27259	4	30	4	32	As the other statements contain data, this one on dietary changes and waste reduction should also be quantitative	accept, we will refine the text	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
6183	4	30	4	33	Recent bush fires might have aggravated emissions (e.g around the Amazon)	accept, we will include more recent trends in deforestation in Amazon	Jude Ndzifon Kimengsi	Department of Geography and Environmental Studies, Catholic University of Cameroon (CATUC)	Cameroon
19687	4	31	4	32	Land can be freed up through sustainable intensification of agriculture, reduced food wastes	unclear what the question is	Mochamad Indrawan	Research Center for Climate Change - Universitas Indonesia (RCCC-UI)	Indonesia
19689	4	31	4	32	presumably, this included agroforestry?	accept, the section 7.4 will have more on agroforestry	Mochamad Indrawan	Research Center for Climate Change - Universitas Indonesia (RCCC-UI)	Indonesia
18125	4	31	4	35	While I agree that such potentials may exist, I doubt whether it is possible to give such exact (or rather whether one should quote such exactoid) numbers. For example, it is not clear that if yields are raised, land is really spared for biodiv conservation or C sequestration, or whether higher yields stimulate higher demand/consumption, e.g. Matson/Vitousek, 2006. Conservation Biology 20: 709–10. https://doi.org/10.1111/j.1523-1739.2006.00442.x. Such systemic feedbacks are very hard to predict. Moreover, "sustainable intensification" is a poorly defined term that means many different things to different people. If at all, such statements can only be made with substantial specification of context informations / conditions assumed when estimating the effect.	accept, we will relate the exe summary text better to the main text to support such statement	Helmut Haberl	Institute of Social Ecology, University of Natural Resources and Life Sciences, Vienna	Austria
238	4	33	4	33	missing %	accept editorial	Diego Morgavi	INRAE	France
5065	4	33	4	33	xx - edition is required	accept editorial	Sayed Masoud Mostafavi Darani	Iran Meteorological Organization	Iran
6261	4	33	4	33	What is an xx share of the 7.2 Mkm2 required? Need to be clear to the readers	accept editorial	Brown Gwambene	Marian University College	United Republic of Tanzania
9767	4	33	4	33	Missing value (xx share)	accept editorial	Jeanne Bormann	Ministry of agriculture	Luxembourg
10573	4	33	4	33	"a xx share of the 7.2 Mkm2 required". Here xx should be a numeric value of sense.	accept editorial	Wen Zhang	Institute of Atmospheric Physics, Chinese Academy of Sciences	China
16815	4	33	4	33	"this way, a xx share of the 7.2" pls address the xx	accept editorial	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
19939	4	33	4	33	"a xx share": add value	accept editorial	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
27261	4	33	4	33	To what do the 7.2 Mkm2 refer to? Required for what?	accept editorial	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
32205	4	33	4	33	a xx share of the 7.2 Mkm2 required: need to give real %	accept editorial	LOKESH CHANDRA DUBE	NATCOM Cell, Ministry of Environment, Forest and Climate Change, Government of India	India
36661	4	33	4	33	correct the xx to value	accept editorial	NARESH KUMAR SOORA	Indian Agricultural Research Institute	India
38611	4	33	4	33	The word of "xx" in a sentence of "a xx share of" need to be filled by number.	accept editorial	Atsushi Sato	Mitsubishi UFJ Research and Consulting Co.,Ltd.	Japan
39249	4	33	4	33	xx	accept editorial	Roberta Zecchini Cantinho	UNDP / UnB	Brazil

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
39763	4	33	4	33	what is xx?	accept editorial	David Manning	Newcastle University	United Kingdom (of Great Britain and Northern Ireland)
44147	4	33	4	33	Maybe in brackets include what this means, an ordinary citizen may not understand this. Can you perhaps provide a defined share value?	accept editorial	Tshepiso Mafole	University of Cape Town	South Africa
46155	4	33	4	33	Remember to change the "xx" to the real share	accept editorial	Daniel Ortiz-Gonzalo	Department of Geosciences and Natural Resource Management, Faculty of Science, University of Copenhagen	Denmark
12053	4	34	4	34	Please define "climate smart forestry" in glossary, or write here what you mean by this term	accept will be taken up in glossary	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
39703	4	35	4	36	As it is quite important, the issue of additional land use through BECCS in the Executive summary needs to be presented in a more balanced way, as it is later in the text (see page 55 lines 1-4).	accept, we will refine text and relate the exe summary text better to the main text to support such statement	Uwe Fritsche	IINAS	Germany
12137	4	36	4	38	What is meant by "high carbon ecosystems" in this respect, and what kind of timescale and system bounary is relevant in this respect? As long as the carbon stocks are maintained or increased within a country or certain area, mitigation effort that temporarily utilise high carbon ecosystems (like forest) and regnerate them, can that be considered as such protetction as metioned here?	reject, here in exec summary we have to be short. in main text such statements will be explained, and form support to the statement	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
46157	4	40	4	40	Not clear what "greenhouse gas fluxes are under pressure" means	reject, unclear comment. not the text on these lines	Daniel Ortiz-Gonzalo	Department of Geosciences and Natural Resource Management, Faculty of Science, University of Copenhagen	Denmark
10397	4	40	4	47	Isn't a key issue that nowhere in the world there is currently any comprehensive price on agricultural emissions (a price currently exists in some jurisdiction as an opt-in possibility, but not as a comprehensive policy). Might it not be important to say this clear (it doesn't have to be a price per se, there also is to my knowledge no policy in place anywhere that would directly and comprehensively address GHG emissions from agriculture in any other (regulatory) way).	partly accept, it addresses the whole issue of carbon taxation, pricing of pollution etc. Based on main text we will refine	Andy Reisinger	NZAGRC	New Zealand
43179	4	40	4	47	not sure this really says anything; presents no evidence, delete or revise?	reject, this section has clear statement, we will however try to refine and improve	Deborah Lawrence	University of Virginia	United States of America
17917	4	42	4	42	"prioritisation of short-term economic gains" rather than the gains itself	accept we will refine sentence	Luke Spajic	University of Adelaide (graduate student researcher), University of Oxford (visiting student researcher)	Australia
25095	4	43	4	43	Delete "there"	accept, editorial	Eleni Kaditi	Organization of the Petroleum Exporting Countries (OPEC)	Austria
39567	4	45	4	45	Good governance, including multi-level governance, aligning all governmental institutions, the private sector, and other civic organizations.	thank you, we will consider the proposal	Marylin Bejarano Castillo	National Water Comission of Mexico	Mexico
44413	4	45	4	45	Despite tradition of the term in some literature, the notion of good governance is morally charged, and not a neutral and scientific notion of governance which, on the other hand, can be qualified by any of its multiple forms. It undergirds a program of bureaucratic and societal reform, and not everyone regards good governance as a self-evident positive contribution to public welfare. This can lead to certain governance arrangements becoming regardes as good in and of themselves rather than as reflections of particular (and contestable) political worldviews. Mitchell, J.K. (2015). Governance of Megacity Disaster Risks: Confronting the Contradictions. In Fra.Paleo, U. (ed.) Risk Governance. The Articulation of Hazard, Politics and Ecology. Dordrecht: Springer. pp. 413-439.	thank you, noted.	Urbano Fra Paleo	University of Extremadura	Spain
5067	4	48	4	50	As accuracy and transparency in estimating and reporting GHG fluxes is needed, ground-based measurements is needed especially in developing countries. Now there is a significant lack in GHG stations in many developing countries and international financial supports is needed.	partly accept, space is limited in exe sum. we will take it up in main text	Sayed Masoud Mostafavi Darani	Iran Meteorological Organization	Iran
38811	4	48	4	50	This conclusion in the executive summary is not supported by the following sentences. The following sentences also do not need the bolded conclusion. Moreover, this sentence seems policy-prescriptive in “incentivizing action through the Global Stocktake”. What kind of action should be incentivized? And by whom? And how? Seems unnecessary unless there are more appropriate sentences included to justify this conclusion.	partly accept, we keep the bold sentence and make sure the rest is in line with it	Julian Reyes	Personal Capacity	United States of America
19941	4	49	4	49	"Stock take": should be one word	accept, editorial	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
10571	4	48	5	3	Apart models and national GHG inventories, remote sensing based methods are also the emerging appliance for the purpose of transparency, credibility and accuracy in estimating and reporting GHG fluxes. In this summary, the possible merit of RS based approaches is worth of noting.	partly accept, space is limited in exe sum. we will take it up in main text	Wen Zhang	Institute of Atmospheric Physics, Chinese Academy of Sciences	China
12201	4	48	5	3	Indeed and that the accuracy should be based on the variable activitity data. Even IPCC defaults should be replaced by conutry-specific ones across land use types by generating data from long-term measurements and importantly true for SOC stock (must not be estmated by using %C but by weight basis). Any models/tools should also validated at country level by considering the contribution of driving variables for upscaling to regional/global level.	partly accept, space is limited in exe sum. we will take it up in main text	Mohammad Ibrahim Khalil	University College Dublin	Ireland
19943	4	48	5	3	This section starts mentioning the Global Stocktake, which considers all kinds of emissions. However, from the second sentence onwards it only focuses on CO2 from land use and forestry. I suggest expanding it to agriculture and CH4 and N2O, also acknowledging the third (and fourth) layer of GHG estimations, which are farm greenhouse gas calculators and plot/area level agricultlral and forest emission models, or clarifying the focus of the paragrpah in the first sentence better	partly accept, we keep the bold sentence and make sure the rest is in line with it	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
19935	4	17	101	14	"GtCO2yr-1": add space before CO2 and before yr	accept editorial	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
22543	4	1			Add “implemented at a… “ so it reads some can be implemented at a low cost…”	must be on page 3. accept, we will refine	Melissa Lucash	Portland State University	United States of America
38081	4	1			"may accrue over many years"	must be on page 3, then line nr. accept, we will refine	Craig Jamieson	Straw Innovations Ltd	Philippines
43953	4	3		5	Sentence is not understandable stand alone. Does it assume emissions reduction or constant emissions as a basis for 30% mitigation??	must be on page 3, then line nr. accept, we will refine	Hans Poertner and Elvira Poloczanska	Alfred-Wegener-Institut	Germany
1383	4	3			I will be interested to see where the calculation of 7.8 GT CO2 comes from; Brazil alone can claims nearly this much from reduced deforestation in the Amazon in the past decade-and-a-half	must be on page 3, then line nr. we explain in main text	Jonah Busch	Earth Innovation Institute	United States of America
22545	4	3			Perhaps “led to” instead of encouraged.	must be on page 3, then line nr. accept, we will refine	Melissa Lucash	Portland State University	United States of America
20151	4	4		9	Is $400b really the number you want to be communicating here? Considering that the current level of investment is 1/400th of what's supposedly needed, the likely message you are telling the world is that it's quite unlikely to happen. Looking at the details, this number is based entirely on top-down IAM without any spatial representation and hence quite meaningless. On the other hand, a recent ODI publication showed that for every dollar spent on forest protection, 100 dollars are spent on incentives (subsidies, tax breaks, direct investments, etc) that encourage deforestation (McFarland et al., 2015. Subsidies to key commodities driving forest loss: Implications for private climate finance. Overseas Development Institute, London.) That's where you find the money!	must be on page 3, then line nr. accept, good reference	Henry Neufeldt	UNEP DTU Partnership	Denmark
22547	4	4			It’s not clear how the 7.8 compares to the 30%. Is it 30% more or a total of 30%? It would be good to put the word total or additional before the 30% and put a % after the 7.8.	must be on page 3, then line nr. accept, we will refine	Melissa Lucash	Portland State University	United States of America
22549	4	12			The “however” is not necessary here.	must be on page 3, then line nr. accept, we will refine	Melissa Lucash	Portland State University	United States of America
43955	4	14		18	Climate target needs to be included in this statement and the quantification as well as again, the background of constant or falling emissions.	must be on page 3, then line nr. accept, we will refine	Hans Poertner and Elvira Poloczanska	Alfred-Wegener-Institut	Germany
5907	4	14		22	Were any assumptions made in the models for land becoming available (eg for energy crops) as a result of moving away from animal proteins and reducing food wastes and losses? Need to clarify.assumptions in brief. Also is this chapter where analysis of the growing market for synthetic animal proteins should be made? Or in the Industry chapter? Or in the Cross cutting chapter? I think the topic may have fallen between the cracks but is important enough to warrant a full debate - eg concerning energy inputs, comparative GHG emissions etc etc.of these novel processes.	must be on page 3, then line nr. exe summary cannot go in detail, we will refine and relate better to main text	Ralph Sims	Massey University	New Zealand
20153	4	14		22	If you write it like this it sounds quite depressing. How is it even possible to suggest that BECCS could require 6.6 Mkm2 and afforestation would need another 7.2Mkm2 in 2100 to reach the mitigation without explaining where the land might come from and how the necessary ecosystem services and food sources will be maintained? That's a technocratic view of the world, and it does not work that way. First, you need to ensure food security and water for a growing population, and you need to make sure that nature can continue to produce the provisioning and regulating ecosystem services we all depend on for life. You'll also need to look at regional differences. Once you have set that aside, you can start playing around with numbers to see what might be possible in terms of mitigation. So, how do you create the space necessary for reforestation, peatland restoration, and (some) biomass energy (in case synthetic fuels powered by renewables have not made that obsolete by then)? Reduction of waste, dietary change toward low animal protein as well as lab food and other altnative protein sources seem like a really good option. If you can create this kind of narrative, people might actually believe that it's possible to mitigate up to 30% of global GHG emissions with land-based solutions. It's a long-term vision, but at least it could work if the systems are designed for it since demand-side solutions, such as dietary change, and novel food sources are already pushing into the market and will surely change agricultural production systems profoundly. But, again, it is imperative not to throw out the baby with the bathwater by suggesting mitigation options that would lead to extremely negative environmental and social externalities.	must be on page 3, and then line: party accept, this is how IAMs work. to some degree the IAMs do first require certain amounts of food, and do leave intact forests intact. still they give solutions as in text	Henry Neufeldt	UNEP DTU Partnership	Denmark

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
43957	4	14		22	Coordination with WGII chapters such as 2, 5 as well as development of a Cross Working Group Box on Land, Bioenergy, Afforestration (BECCs, CDR etc) should be investigated. Alternatively, an emphasis of energy crops might be justified.	must be on page 3, and then line. accept, this is what we do	Hans Poertner and Elvira Poloczanska	Alfred-Wegener-Institut	Germany
21561	4	15			sould be write B…E..C…C…S…(BECCS)…FIRSTtime and then for the next can use abrifiation	must be on page 3, and then line:. accept , editorial	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
43677	4	17			An uncommented provision of a 15Gt BECCS value in the ES camouflages the high risks associated with such large-scale deployment of bioenergy. IAMs deliver NETs up to now mostly via BECCS but other NETs come increasingly into IAMs thus potentially replacing the need for BECCS in models. The potential of BECCS as a bug, not a feature, of models should be considered.	must be on page 3, and then line:. accept, we will refine, but space is limited	Felix Creutzig	MCC Berlin	Germany
43171	4	25			give a range, with ±; these are not exact numbers and should not be presented as such.	must be on page 3, and then line:. accept, we will refine, but space is limited	Deborah Lawrence	University of Virginia	United States of America
17757	4	33		33	xx pending value to be provided	must be on page 3, and then line:. accept , editorial	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
735	4	33			what is a "xx share"?	must be on page 3, and then line:. accept , editorial	Rémi CARDINAEL	CIRAD	France
21563	4	33			1xx ???	must be on page 3, and then line:. accept , editorial	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
29911	4	33			Please insert specificwords instead of "xx".	must be on page 3, and then line:. accept , editorial	RAEHYUN KIM	Institute	Republic of Korea
35105	4	33			could a “xx” be defined?	must be on page 3, and then line:. accept , editorial	Happiness Nnko	The University of Dodoma	United Republic of Tanzania
43177	4	33			required' for what?	must be on page 3, and then line:. accept , will refine	Deborah Lawrence	University of Virginia	United States of America
1387	4	40			Yes. See e.g. Griscom et al (2020) Phil Trans Roy Soc B	must be on page 3, and then line:. noted	Jonah Busch	Earth Innovation Institute	United States of America
22551	4	43			Omit “there”.	must be on page 3, and then line:. accept , editorial	Melissa Lucash	Portland State University	United States of America
22553	4	47			I think you could omit “mediated by drivers” to improve readability of the sentence.	must be on page 3, and then line:. accept , editorial	Melissa Lucash	Portland State University	United States of America
21565	4	48			GHG?	must be on page 3, and then line:. accept , editorial	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
46159	5	24	4	24	There are no silver bullets, but mixes of options depending of the regional, cultural and political contexts	Editorial: Sentence will be rewritten	Daniel Ortiz-Gonzalo	Department of Geosciences and Natural Resource Management, Faculty of Science, University of Copenhagen	Denmark
46489	5	1	5	47	The recent IPBES report should also be taken into account in this section.	IPBES report will be considered in the next version of the chapter	Rachel Bezner Kerr	Cornell University	United States of America
28769	5	6	5	7	It would better to introduction was begined with some introcutive sentences and then went throughout the key findings from previous reports	Good comment	Alireza Yazdani	Shiraz University	Iran
12027	5	8	5	30	The summary of key findings from previous reports is very good. Please keep this.	Thanks for your positive remark	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
28771	5	8	5	30	The key findings are written in general and unclear. Most of them are exemplar, and so make them difficult to understandable for readers. Furthremore, some of findings are ambiguous and so non-apprehensible for who is the first time know about that. Maybe, a very short desription about the history of previous reports are helpful.	Key findings are summarized and not meant to present details.	Alireza Yazdani	Shiraz University	Iran
4921	5	10	5	30	I think you also need to point out the uncertainty around the permanence of carbon storage in AFOLU (natural sink enhancement), e.g., afforestation could be subject to increased wildfires - linked to a changing/warming climate	such details will be presented in sections related to carbon storage in the second version of the chapter	Patrick Lamers	National Renewable Energy Laboratory	United States of America
27263	5	10	5	30	A critical insight from the 1.5° and SRCCL reports is missing hier: the timing and time-dependency of action is critical. Early action is associated with much reduced pressures/impacts than late action, in land-use as well as in other sectors. This also entails that the time-horizon of actions and their effects is crucial, time-buying mechanisms are required (ie. strategies which bring immediate/quick net-effects of mitigation can be advantagous even if they are not the most powerful in the long run - as the energy system requires time to decarbonize).	Time scales (short vs long-term) actions or strategies discussed in later sections and not in this section summarizing insights from previous reports	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
38667	5	12	5	16	There are other things that constrain the potential that are realted to other land and ecosystem services (like biodiversity conservation, water) as weel as cultural and social barriers. It is some how refelcted in the SRCCl	Such issues will be covered in second draft of the chapter	Maria Jose Sanz Sanchez	Basque Center for Climate Change	Spain
6185	5	13	5	14	differential tenure arrangements equally shape the dynamics of the AFOLU sectors	agree on issues of land tenure and considerable effects and dynamics related to AFOLU.	Jude Ndzifon Kimengsi	Department of Geography and Environmental Studies, Catholic University of Cameroon (CATUC)	Cameroon

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
22137	5	16	5	16	"models used"	to be specified	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
12203	5	17	5	19	Soil and environmental conditions as driving varibale are missing.	soil and environmental conditions are included in global drivers and challenges. But they are highly variable and spatial dependent.	Mohammad Ibrahim Khalil	University College Dublin	Ireland
22261	5	17	5	19	Please clarify section 2.	Accepted	Noureddine Benkeblia	The University of the West Indies	Jamaica
16829	5	18	5	18	Remove extra '.'	Accepted	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
19945	5	18	5	18	"and.": delete full stop	Accepted	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
33057	5	18	5	19	There is a large uncertainty over AFOLU's mitigation potentia l, in part because current stocks and fluxes are uncertain and are subject to variability over time with weather and. climate change; Edit …and climate change. Remove dot after …anc	Accepted	Mirzokhid Mirshadiev	Wageningen University and Research	Netherlands
44149	5	18	5	19	Please remove full stop (.)	Accepted	Tshepiso Mafole	University of Cape Town	South Africa
16831	5	19	5	30	I feel that this list has too many points, and that its better to limit it to five points, be be short and consise (hence more impactful). Point 7 seems to be very similar to 1, and may be merged. Likewise, point 5 may be also merged into 1. But lii	Good comment. we will rearrange or rephrase list	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
38669	5	22	5	23	Cost ae being estimated as low in many cases becasue they relfect partially the real cost. May this message can be elaborated a bit more.	this general statement. Costs of mitigation options will be detailed in the chapter	Maria Jose Sanz Sanchez	Basque Center for Climate Change	Spain
18629	5	24	5	24	Maybe this could be clarified with one additional sentence: what is the specific impact of CC on carbon stocks? How large/widespread/risky is the impact?	this general key finding and details should be done in other sections of the chapter.	Charlotte Janssens	KU Leuven	Belgium
38671	5	24	5	25	What is under pressure is the ecosystems, not the stocks themselves. May be you can reformulate the sentences i a more sensible manner.	we will reformulate it for SOD	Maria Jose Sanz Sanchez	Basque Center for Climate Change	Spain
39569	5	25	5	27	The main reason for explaining this insufficient global approach is that the Paris Agreement has not been mandatory for parties.	noted good remark	Marylin Bejarano Castillo	National Water Comission of Mexico	Mexico
40371	5	27	5	27	also ecological centext	it can be added	Gunta Kalvane	University of Latvia	Latvia
18631	5	29	5	29	between which options?	Mitigation options are presented in various reports and should be considered further in sections for SOD	Charlotte Janssens	KU Leuven	Belgium
6769	5	29	5	30	"between options and with other Sustainable …" I would take out the word "with", so change it to " between options and other Sustainable…"	Accepted	Valasia Iakovoglou	International Hellenic University	Greece
4923	5	30	5	30	Have you also looked at how this relates to Nature's Contributions to People (NCP)?	to be considered	Patrick Lamers	National Renewable Energy Laboratory	United States of America
43333	5	32	5	32	the orginal paper refers to 25%, not 30%	Yes 25% rather than 30%	Giacomo Grassi	Joint Research Centre, European Commission	Italy
12205	5	32	5	39	There is lack of measured information on coupled GHG emitting from a land use system to draw a system-wise conclusion and recommendation.	key point 7 will be corrected	Mohammad Ibrahim Khalil	University College Dublin	Ireland
38679	5	32	5	53	Recomendation: more clarity on whare the statement come from and what is the additional findigs in the 6AR WGII respect to the SRCCL will be helpful.	based on literature reviews.	Maria Jose Sanz Sanchez	Basque Center for Climate Change	Spain
12779	5	33	5	33	Grassi, 2017 ? (missing the 1)	Accepted. it will be corrected	antoine leblois	INRA	France
16833	5	33	5	33	Grassi et al, 207: Pls correct the year. Also 'et al.' is used incorrectly in this part, and some other places in the chapter. Pls correct it throught.	Accepted. it will be corrected	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
18633	5	33	5	33	correct year in reference: Grassi et al. 2017	Accepted. it will be corrected	Charlotte Janssens	KU Leuven	Belgium
19947	5	33	5	33	"Grassi et al, 207": should be "Grassi et al, 2017"?	Accepted. it will be corrected	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
28061	5	33	5	33	Grassi et al, 207, The reference should be cited correctly	Accepted. it will be corrected	Alix Frank Rodrigue Idohou	National University of Agriculture	Benin
28309	5	33	5	33	a number is missing in the reference Grassi et al.	Accepted. it will be corrected	catherine Hénault	INRAE	France
31971	5	33	5	33	year for reference Grassi et al is wrong (2017)	Accepted. it will be corrected	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
33059	5	33	5	33	reference was not properly styled : (Grassi et al, 207)	Accepted. it will be corrected	Mirzokhid Mirshadiev	Wageningen University and Research	Netherlands
38673	5	33	5	33	Grassi et al 2017	Accepted. it will be corrected	Maria Jose Sanz Sanchez	Basque Center for Climate Change	Spain

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
38675	5	33	5	33	Recomend to elaborate more on what is meant by 30% contribution to the NDC potential (including all sectors?, 30% of what contribution to the need full fill the PA goal?).	it is referenced	Maria Jose Sanz Sanchez	Basque Center for Climate Change	Spain
38737	5	33	5	33	The citation of Grassi et, al 207 needs reformating, and ideally a range, NDCs have been updated since 2017/2007	it will corrected	Adriana Mordente	United Nations Convention to Combat Desertification	Germany
38615	5	34	5	37	Reducing emissions, enhanced carbon stock and producing bioenergy are the active mitigation measure in this sector. In addition to these, maintaining carbon stock with using those land in a sustainable manner is also important measure relating to climate change. I think it worth referring this feature somewhere else in this chapter	it will considered	Atsushi Sato	Mitsubishi UFJ Research and Consulting Co.,Ltd.	Japan
28063	5	35	5	35	delete e,g.	it will corrected	Alix Frank Rodrigue Idohou	National University of Agriculture	Benin
38613	5	35	5	35	It is a little unclear the words of "GHG CO2, CH4 and N2O" because CO2, CH4 and N2O are a part of GHG.	accepted and it will corrected	Atsushi Sato	Mitsubishi UFJ Research and Consulting Co.,Ltd.	Japan
22263	5	36	5	36	soil carbon sequestration…..	change will be done	Noureddine Benkeblia	The University of the West Indies	Jamaica
32895	5	36	5	37	Remove 'this is the only sector where carbon removals are currently possible at scale' or add further explanation that this potential is currently not realized at all.	it will be discussed	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
22265	5	36	5	45	How can food wastage reduce emission?	it is referenced in SRCCL and additional literature is under development	Noureddine Benkeblia	The University of the West Indies	Jamaica
38677	5	38	5	38	you mean renovable instead the low-carbon?	term will be changed	Maria Jose Sanz Sanchez	Basque Center for Climate Change	Spain
29151	5	38	5	39	Biomass for energy is controversial given the loss of biodiversity in some countries. It might be useful to elaborate further on this issue	it is discussed in the chapter and further in SOD	SMAIL KHENNAS	Energy and Climate Change Consultant	United Kingdom (of Great Britain and Northern Ireland)
19951	5	41	5	42	"Several individual mitigation response options have a technical potential for >3 GtCO2-eq y-1 by 2050": not clear if indiviudally or together	noted and it will changed	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
19953	5	41	5	42	"Several individual mitigation response options have a technical potential for >3 GtCO2-eq y-1 by 2050": it would help the reader if the total annual AFOLU GHG emission value was provided here	it will be considered	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
29913	5	41	5	42	Several sentences cited from SRCCL(Part B). However, the range of technical potential of mitigation response, level of confidence and duration are differ. [SRCCL Part B] B5.3 "Reducing deforestation and forest degradaton lowers GHG emissions(hgh confidence), with an estimated technical mitigation potential of 0.4-5.8 GtCO2/yr." B6. "The total technical mitigation potential from crop and livestock activities, and agroforestry is estimated as 2.3-9.6 GtCO2eq/yr by 2050(medium confidence). The total technical mitigation pootential of dietary chnages is estimated as 0.7-8 GtCO2eq/yr by 2050(medium confidence)." B6.2. "By 2050, dietry changes could free seveal million Km2(medium confidence) of land and provide a technical mitigation poetntail of 0.7 to 8.0 GtCO2eq/yr, relative to business as usual projections(high confidence)."	noted and to be considered	RAEHYUN KIM	Institute	Republic of Korea
98	5	41	5	44	It would be good to specify which AFOLU acticities are migiation and which are CDR and also specify the activities where there is significant overlap between mitigation and CDR. Otherwise, it is very confusing.	such details will be presented in sections in the second version of the chapter. AFOLU related CDR measures are considered in this chapter.	Govindasamy Bala	Indian Institute of Science	India
22135	5	44	5	44	Zero-burning land clearing and fire prevention (both forest and peat) also play important roles in reducing GHG emission	these measures are important and will be considered	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
27265	5	44	5	45	sustainable intensification needs a definition here. For its implications in this context, see eg. Doi 10.1890/130157, doi 10.1016/j.jrurstud.2011.09.001.	accepted. It will be added	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
31969	5	44	5	47	Full utilisation of agricultural products: crop residues, manures, animal parts should be stated as a matter of urgency in this list	such details are not needed at this level	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
46485	5	44	5	47	The Special Report on Land did not just or primarily highlight sustainable intensification of land (which emphasizes efficiency and productivity) but rather alternative approaches to land management, such as agroecology. There is still scientific debate about which overarching approach (sustainable intensification vs agroecology) is more effective at sustainable outcomes, including food security, climate change adaptation and mitigation. Insitutional and political drivers may influence whether intensification reduces or increases deforestation. Relevant references include: Garrett, R. D., Koh, I., Lambin, E. F., le Polain de Waroux, Y., Kastens, J. H., & Brown, J. C. (2018). Intensification in agriculture-forest frontiers: Land use responses to development and conservation policies in Brazil. Global Environmental Change, 53, 233–243. https://doi-org.proxy.library.cornell.edu/10.1016/j.gloenvcha.2018.09.011; Harvey CA, Chacón M, Donatti CI, et al. Climate-Smart Landscapes: Opportunities and Challenges for Integrating Adaptation and Mitigation in Tropical Agriculture. Conservation Letters. 2014;7(2):77-90. doi:10.1111/conl.12066. and HLPE. 2019. Agroecological approaches and other innovations for sustainable agriculture and food systems that enhance food security and nutrition. UN Committee on World Food Security, Rome; Landholm DM, Pradhan P, Wegmann P, Romero Sanchez MA, Suarez Salazar JC, Kropp JP. 2019. Reducing deforestation and improving livestock productivity: greenhouse gas mitigation potential of silvopastoral systems in Caqueta. ENVIRONMENTAL RESEARCH LETTERS. 14(11). doi:10.1088/1748-9326/ab3db6.	good comments. It will be considered in second version of the report. references will be used. Box on sustainable intensification will be added to the chapter.	Rachel Bezner Kerr	Cornell University	United States of America
19189	5	47	5	47	The acronym SRCCL (Special Report on Climate Change and Land) needs to have its full name spelled out the first time it appears in this document and/or be added to Annex A - Glossary	Accepted. It will be done.	Cheah Singfoong	Independent consultant, formerly more than 10 years with the National Renewable Energy Laboratory, USA	United States of America
28065	5	52	5	53	The idea provided there needs a strong supoting reference	Accepted	Alix Frank Rodrigue Idohou	National University of Agriculture	Benin
39831	5	8	6	19	Glad to see the comparison between this and the previous reports, but would become informative if which special reports (and chapter) are referred to in each bullet.	Noted, thanks for the suggestion	Hasegawa Toshihiro	National Agricultural and Food Research Organization	Japan
28773	5	32	6	19	What`s the realtionship between seven key findings from previous reports with next four paragraphs? Is it possible to combie together?	good comment. a connecting sentence will be added and reviewed some key points	Alireza Yazdani	Shiraz University	Iran
11261	5	8	8	27	What is the point of departure ? Why all previous IPCC reports has to be evaluated?	in order to get latest findings and build from that	Mahmood Riyaz	Maldivian Coral Reef Society	Maldives
19949	5	33	100	31	be consistent with in-text reference formatting (e.g. full stop, comma, both or nothing after "et al")	accepted and noted	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
21567	5	15			after thus should be comma	accepted and noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21569	5	18			after end full stop	accepted and noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21571	5	24			GHG?	noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
22555	5	24			I don’t agree that GG fluxes are under pressure from climate change. Perhaps just state the C stocks are vulnerable to CC.	noted	Melissa Lucash	Portland State University	United States of America
6863	5	25			Add (.) after " 2017)"	accepted and noted	Valasia Iakovoglou	International Hellenic University	Greece
21573	5	30			SDGs?	will be defined	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
17759	5	32		32	... National Determined Contributions (NDC)s	accepted and noted	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
1389	5	32			Here it says 30%; above it says 25% (and I believe the Grassi et al paper also says 25%). Double check this.	accepted and noted	Jonah Busch	Earth Innovation Institute	United States of America
43181	5	32			give year for this number; e.g. 30% by 2030. (or 2050 or whenever it needs to be)	accepted and noted	Deborah Lawrence	University of Virginia	United States of America
17761	5	33		33	in: (Grassi et al, 207) should be 2017	accepted and noted	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
737	5	33			Correct the date of "(Grassi et al, 207)"	accepted and noted	Rémi CARDINAEL	CIRAD	France
3317	5	33			Just check the reference (Grassi et al, 207) - the year is missing a digit	accepted and noted	Michelle North	University of KwaZulu-Natal (UKZN)	South Africa
15099	5	33			Grassi 207 => Grassi 2017	accepted and noted	Gilbert Ahamer	Environment Agency Austria	Austria
16497	5	33			Grassi et al., 2017	accepted and noted	Mostafa Jafari	Head of TPS for LFCCs/ and IPCC LA	Iran
29513	5	33			A typo in the year of reference	accepted and noted	RAEHYUN KIM	Institute	Republic of Korea

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
35107	5	33			(Grassi et al. 2017) instead of (Grassi et al, 207)	accepted and noted	Happiness Nnko	The University of Dodoma	United Republic of Tanzania
43183	5	33			what does it mean? 'mitigation scenarios find a large role for AFOLU' -- find? Do you mean reveal, suggest, show?	show	Deborah Lawrence	University of Virginia	United States of America
6771	5	34		39	I would suggest breaking the sentence into subparts. In case you prefer the use of ";", please use properly.	noted	Valasia Iakovoglou	International Hellenic University	Greece
21575	5	35			(e.g. from……)	it will be corrected	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
17763	5	37		39	It is important to note that a Life Cycle Analysis (LCA) and carbon footprint is needed in each case to be sure.	suggestions to be discussed for further use in SOD	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
14747	5	37			removals are currently possible at large scale	it will be referenced	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
14749	5	38			fuels 9first and second generation fuels	not clear comment	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
35109	5	41			3 GtCO2-eq yr-1 for consistency it should be presents as 3 GtCO2-eyr-1	noted	Happiness Nnko	The University of Dodoma	United Republic of Tanzania
14751	5	45			production, reduced post harvest losses, reduced food loss--	all matter in sustainable intensification	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
29915	5	47			It need to insert "forest restoration" based on panel B of Figure SPM.3 in SRCCL.	it will be added	RAEHYUN KIM	Institute	Republic of Korea
18635	6	1	6	2	Same comment as p7-5 line 24: maybe one sentence can be added to explain how and to what extent carbon stocks and sinks can be at risk from climate change.	it might be discussed in other sections of the chapter	Charlotte Janssens	KU Leuven	Belgium
1491	6	4	6	4	There are two "both" here	Accepted. it will be corrected	JUNGUO LIU	Southern University of Science and Technology	China
19955	6	4	6	4	"both AR5 and SRCCL both": delete on 'both'	Accepted. it will be corrected	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
25097	6	4	6	4	Delete "both"	Accepted. it will be corrected	Eleni Kaditi	Organization of the Petroleum Exporting Countries (OPEC)	Austria
17919	6	4	6	6	could also mention difficulty of converting short lived pollutants into co2 equivalents	it is noted	Luke Spajic	University of Adelaide (graduate student researcher), University of Oxford (visiting student researcher)	Australia
32897	6	4	6	7	Technically, it is not AR5 and SRCCL that 'found' anything about GHG emissions and related uncertainty, but the underlying research that is summarized in these reports. I think it is useful to be precise here.	noted	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
28941	6	4	6	10	You compare the AR5 and SRCCL and state that the result of those two documents are relatively same. But you only show the value of SRCCL. I suggest you to make a table to compare both documents. Or, if you think those documents are mostly the same, please make this paragraph more concise.	noted	Marissa Malahayati	National Institute for Environmental Studies	Japan
46163	6	4	6	19	This paragraph starts with the 23% share of AFOLU, but then includes only CO2 fluxes. Please also consider the inclusion of CH4 and N2O fluxes in this section [44% of anthropogenic methane (10.1 ± 3.1 Gt CO2 eq) and 82% of anthropogenic nitrous oxide (2.8 ± 0.7 Gt CO2 eq)] according to SRCCL	noted	Daniel Ortiz-Gonzalo	Department of Geosciences and Natural Resource Management, Faculty of Science, University of Copenhagen	Denmark
32211	6	5	6	5	Delete 23%, SRCCL or mention for both AR5 and SRCCL	noted and should be considered	LOKESH CHANDRA DUBE	NATCOM Cell, Ministry of Environment, Forest and Climate Change, Government of India	India
44151	6	5	6	5	There is a bit of redundancy in this sentence. You have mentioned that AFOLU contributes about 23 % of GHG emissions for the third time already, maybe rephrase. Suggestion " ..in addition to contributing 23 % GHG net emissions (also is this per year?), both AR5 and SRCCl provide an uncertainty in sources and sinks...."	this paragraph will be reconsidered	Tshepiso Mafole	University of Cape Town	South Africa

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
47553	6	5	6	5	the mentioned 23% would need a confidence interval.	noted and should be considered	Zoltán Rakonczay	European Commission, Directorate General for Research	Belgium
38681	6	5	6	7	Can the authros proive a sense of comparation of the uncertanty with other sectors?. We always say they are high in AFOLU, what what mean high comapared to other sectors. The fact that is difficult to separate antrhpogenic form not antropogenic is not related to the uncertaty of the estimates but rather to the comparability of them if diferent approaches for separation are used.	this section relate to key findings from previous reports on lands and AFOLU.	Maria Jose Sanz Sanchez	Basque Center for Climate Change	Spain
16839	6	8	6	8	Period of flux (eg, during years 2000-2010) unspecified.	it will be added	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
16837	6	10	6	10	Missing fullstop.	Accepted. it will be corrected	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
19957	6	10	6	10	"2016 Thus": full stop after 2016	Accepted. it will be corrected	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
39571	6	10	6	10	Insert ".".	Accepted. it will be corrected	Marylin Bejarano Castillo	National Water Comission of Mexico	Mexico
29921	6	10	6	12	The assed likelihood in the sentence, 'very likely', should change 'likely range'. Please, check the original language. "The sum of the net removals due to this response and the AFOLU net emissions gives a total net land-atmosphere flux that removed 6.0+_3.7 GtCO2/yr during 2007-2016(likely range). "	it will be rechecked	RAEHYUN KIM	Institute	Republic of Korea
44153	6	10	6	18	Please double-check the use of punctuation marks in this paragraph.	Accepted. it will be corrected	Tshepiso Mafole	University of Cape Town	South Africa
20641	6	11	6	12	If I understand this statement correctly, the number should be (positive) 6.0 +/-3.7. A negative net removal is an emission.	Accepted. it will be corrected	Vassilis Daioglou	Copernicus Institute of Sustainable Development	Netherlands
31973	6	12	6	12	statement 'of (-6.0 ± 3.7 GtCO2 yr-1)' does not need parenthesis	Accepted. it will be corrected	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
14753	6	12	6	14	(anthropogenic emissions of CO2 from AFOLU reported in countries' GHG inventories were 0.1 ± 32 1.0 GtCO2 yr-1 globally) The values need to be rechecked	it will be rechecked	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
566	6	13	6	13	there is a problem with the number as reported	it will be rechecked	Pierre Bernier	Natural Resources Canada	Canada
3051	6	13	6	13	Check reported flux number - unclear (typo?) in text curently	Thank you	Dave Reay	University of Edinburgh	United Kingdom (of Great Britain and Northern Ireland)
17249	6	13	6	13	Please check numbers: "0.1 +/- 32 1.0 GtCO2" seems not to be a correct numerical expression.	Accepted. it will be corrected	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany
19959	6	13	6	13	"0.1 ± 32 1.0 ": correct numbers	Accepted. it will be corrected	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
39573	6	13	6	13	There is a error in the following number: 0.1 ± 32 1.0 GtCO2	Accepted. it will be corrected	Marylin Bejarano Castillo	National Water Comission of Mexico	Mexico
43335	6	14	6	14	suggest "human-induced" before "environmental change"	suggestion considered	Giacomo Grassi	Joint Research Centre, European Commission	Italy
16835	6	16	6	16	is broader than the models use > "is broader than those used in the models"	it will be corrected	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
38683	6	18	6	19	I suggest to change to "towards meeting the PA goals", beacuse this is the objective of the GST, modelled mitigation pathways are not the objective but rather one element of the IPCC in their assesements	this suggestion will be considered	Maria Jose Sanz Sanchez	Basque Center for Climate Change	Spain
12207	6	32	6	36	Land can't have interaction with a chapter rather can have a link with the contents/parameters and interactive functional relation between the contents of chapters.	this is just to show the interactions of AFOLU chapter with other chapters in order to not have overlaps or gaps.	Mohammad Ibrahim Khalil	University College Dublin	Ireland
32899	6	32	6	36	Why only some of the links to other chapters displayed in Figure 7.1 are mentioned here?	most important links are considered in figure 7.1 and can be differentiated and re enforced if needed or asked from other chapters	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
28943	6	32	6	38	You want to show that chapter 7 has relation with other chapter, then you show Figure 7.1. I hope you can improve the figure, or change it into table or something that can explain further what is the cross-cutting between this chapter with other chapter? What is the scope of this chapter and how it is "different" until we need to make a special chapter for AFOLU. Something like that.	Figure 7.1 is a configuration of chapters cross-links and it can be improved over time and further readings.	Marissa Malahayati	National Institute for Environmental Studies	Japan
10401	6	35	6	36	insert "some of" after 'namely' - many (most?) mitigation options in those other sectors do not depend critical on the provision of land or biomass (or if you feel this is wrong, please provide the quantitative evidence)	good comment. the sentence will be rephrased and finalized	Andy Reisinger	NZAGRC	New Zealand
19961	6	35	6	36	"Namely mitigation options in those chapters are to more or less degree determined by (im) possibilities in the land sector.": suggest editing the sentence, e.g. "The future deployment of mitigation options mentioned in those chapters are - to some extent - determined by possibilities in the land sector."	thanks for the suggestion. It can be used in stead or rephrase the paragraph.	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
39765	6	35	6	36	this sentence doesn't make sense	good comment. the sentence will be rephrased and finalized	David Manning	Newcastle University	United Kingdom (of Great Britain and Northern Ireland)
11265	6	36	6	37	Where is small islands fall lin this figure, special case of small islands in AFOLU has to be made	suggestion considered	Mahmood Riyaz	Maldivian Coral Reef Society	Maldives
28775	6	37	6	38	Well-done. Figure 7-1 desribe interactions of chapter 7 to WGII and to other chapters in this report in well.	Noted and it can be improved further even.	Alireza Yazdani	Shiraz University	Iran
28777	6	37	6	38	Where did you refer to Figure 7-1? Where did you use this figure in the text?	we will add	Alireza Yazdani	Shiraz University	Iran
12209	6	38	6	38	Fig, 7.1. Links of chapter instead of interactions, should be corrected.	chapter's cross-cutting links or feedbacks.	Mohammad Ibrahim Khalil	University College Dublin	Ireland
16841	6	38	6	38	I could not find the reference to this figure in the text.	will be added	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
28781	6	37	7	12	There was written Figure 7-1 and then Fig 7-1. Follow the similar pattern, Fig or Figure.	it will be corrected	Alireza Yazdani	Shiraz University	Iran
22557	6	4			Omit one “both	it will be corrected	Melissa Lucash	Portland State University	United States of America
22559	6	6			I don’t think the uncertainty is exacerbated. Maybe just say uncertainty is high because it is difficult to separate natural and anthro fluxes.	it will be corrected	Melissa Lucash	Portland State University	United States of America
43185	6	7			insert 'land-based' before activities. There are lots of anthropogenic activities, be explicit (even if we are in the land chapter)	well noted	Deborah Lawrence	University of Virginia	United States of America
29917	6	8			Please insert "human-induced" in accordance with original sentence.	Noted and it can be improved further even.	RAEHYUN KIM	Institute	Republic of Korea
29919	6	9			What is the meaning of 'climate create a sink'? I think that the original languages is more clear which is "increasing atmospheric CO21 concentration, nitrogen deposition, and climate change, resulted in global net removals". FYI, the definitions of 'sink' is 'means any process, activity or mechanism which removes a grrenhous gas, an aerosol or a precursor of a greenhous gas from the atmosphere.' under the UNFCCC Convention.	sentence will be rewritten	RAEHYUN KIM	Institute	Republic of Korea
6773	6	10			Add (.). "2016 Thus" to "2016. Thus..."	Accepted. it will be corrected	Valasia Iakovoglou	International Hellenic University	Greece
21577	6	10			after 2016 fullstop, Thus, …….	Accepted. it will be corrected	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
22561	6	10			You are missing a period after 2016.	Accepted. it will be corrected	Melissa Lucash	Portland State University	United States of America
29923	6	10			Please insert "." after 2016.	Accepted. it will be corrected	RAEHYUN KIM	Institute	Republic of Korea
35111	6	10			full stop at the end of a sentence ending 2006	Accepted. it will be corrected	Happiness Nnko	The University of Dodoma	United Republic of Tanzania
6891	6	12			I would suggest taking out the parenthesis, so "2007 to 2016 of (-6.0 ± 3.7 GtCO2 yr-1)." To "2007 to 2016 of -6.0 ± 3.7 GtCO2 yr-1."	Accepted. it will be corrected	Valasia Iakovoglou	International Hellenic University	Greece
3319	6	13			"0.1 ± 32 1.0 GtCO2 yr-1" please check if this number is correct	Accepted. it will be corrected	Michelle North	University of KwaZulu-Natal (UKZN)	South Africa
29925	6	13			it need to delete "32" in the sentence. Please check the original language in SRCCL. "from 2005 to 2014, the sum of the national GHG inventories net emission estimates is 0.1+_1.0 GtCO2/yr,'	Accepted. it will be corrected	RAEHYUN KIM	Institute	Republic of Korea
22563	6	23			Replace “impact” with “affect the…”	Accepted. it will be corrected	Melissa Lucash	Portland State University	United States of America
22565	6	25			Replace with “at different spatial..”	Accepted. it will be corrected	Melissa Lucash	Portland State University	United States of America
43187	6	25			not 'in' but 'on'	it will be corrected (at different scales)	Deborah Lawrence	University of Virginia	United States of America
6775	6	32			Reword the part "Land has many interactions with other chapters"	it will be changed	Valasia Iakovoglou	International Hellenic University	Greece
22567	6	32			Replace with “This chapter on AFOLU does not exist in isolation, since land affects food and fibre…”	Noted and it can be improved further even.	Melissa Lucash	Portland State University	United States of America

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
3321	6	37			It isn't quite clear where the WGII chapters fit into this diagramme - I recommend moving the WG text box/heading to the left to indicate which hexagon it is referring to. Unless WGII chapters don't have hexagons at all? This is unclear in the current visualisation - play with other options of demonstrating the interconnectedness, I think there may be better methods of showing what you're trying to with better clarity. The policies & SDGs chapters surely relate back to all the core chapters, not just the two on the top left? AFOLU almost underpins all the rest, right? So could put it as like the basement, like a floor/bar, with the other chapters rising up out of it (because they depend on AFOLU), and all surrounded by the cross sectoral chapter, with policies / SDGs as like a sky? I'm not sure if I'm explaining this clearly	Figure 7.1 is a configuration of chapters cross-links and it can be improved over time and further readings.	Michelle North	University of KwaZulu-Natal (UKZN)	South Africa
5909	6	38			There are also links between energy demand and food - incuding decentralised energy systems - see https://unfccc.int/documents/200379 A series of FAO reports on Energy-smart food started in 2012 (http://www.fao.org/3/a-i2454e.pdf) that showed the energy inputs and emissions from the agri-food sector. see http://www.fao.org/energy/publications/en/ as several are relevant here. Could also mention the SDGs in this section.	Figure 7.1 is a configuration of chapters cross-links and it can be improved over time and further readings.	Ralph Sims	Massey University	New Zealand
21579	6	38			consistensi in table write Fig 7.1 and use fullstop at the end???	noted.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
12139	7	2	7	7	2030 and 2050 as timescale seems very short for boreal forest? Why not use 100 yrs as in the RCPs or by the second half of the century as in the Paris agreement? Or is not timescale relevant for the conclusions here?	it literature allows	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
32901	7	2	7	9	Here, the focus on 'regionalizing mitigation options' is emphasized. However, from reading the chapter I don't see a huge effort on regionalization. In fact, there are 'regional examples' at many instances, but a comprehensive regional assessment of GHG emissions and mitigation options is missing (and probably still difficult with current knowledge).	regionalisation will be more developed and emphasized in SOD	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
32903	7	2	7	9	While it is indeed important to go beyond purely biogeochemical mitigation options, I don't see a lot of biophysical aspects discussed in this chapter. As WGIII reports are mainly about 'mitigation of climate change' (which according to the glossary refers to 'human interventions to reduce emissions or enhance sinks of greenhouse gases'), I am not sure how much added value the biophysical aspects have in the context of this chapter. It's possibly better to reduce complexity and stick GHGs emissions reductions and removal.	this aspect will be much discussed and presented in SOD	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
39259	7	3	7	3	Foot note 4 says that biomass burning is included in the line "CO2 (land-use and land-use change)" but it should be related also do CH4 and N2O emissions, right?	reported in section 7.3.3.	Roberta Zecchini Cantinho	UNDP / UnB	Brazil
32207	7	5	7	5	Grassi et al. 207: Year to be corrected	Accepted. it will be corrected	LOKESH CHANDRA DUBE	NATCOM Cell, Ministry of Environment, Forest and Climate Change, Government of India	India
19963	7	7	7	7	"touched upon": this suggests light consideration only - migth need a word expressing a more serious analysis	Accepted. it will be corrected	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
28311	7	10	7	10	I suggest to introduce an arrow representing that soil respiration produces N2O	it will added	catherine Hénault	INRAE	France
43337	7	10	7	10	Sugges to consider noting in the caption that non-CO2 closely corresponds to Agriculture and CO2 to LULUCF in GHG inventories. Visually, this can be done also e.g. shifting to the extreme left the cow	it will be considered in a new version of fig 1.2.	Giacomo Grassi	Joint Research Centre, European Commission	Italy
1429	7	10	7	11	Include in the figure the roots of trees, crops and plants as are relevant to carbon sequestration	fig 7.2 will be improved	Juan Jose Grigera Naón	Sociedad Rural Argentina (member of ICC Argentine branch)	Argentina
8553	7	10	7	11	This conceptual figure looks less informative and may lead misunderstanding. For example, no respiration by plants is shown, natural soil CH4 uptake/emission and N2O emission are not shown. I know all fluxes cannot be included, but this figure seems too coarse for me.	fig 7.2 will be improved	Shoji Hashimoto	Forestry and Forest Products Research Institute / The University of Tokyo	Japan
25865	7	10	7	11	The CH4 transport pathway through the tree stems is not clearly indicated. Furthermore, CH4 emissions from crops are not indicated in the figure. Crops like rice, cultivated under water saturated conditions, emit substantial amounts of CH4 to the atmosphere. This has been well documented and it has been mentioned on previous reports. Crops also release substantial amounts of N2O depending on the fertilization method that is used. So, both CH4 and N2O should be included in the crop section of the figure.	fig 7.2 will be improved	Jorge Hoyos-Santillan	University of Magallanes	Chile
25875	7	10	7	11	Once again, the observation regarding Brazil should be reconsidered. Perhaps it could be treated as an example of the direct impact of a strong shift in governmental policies over carbon emissions trends. Deforestation in Brazil increased 30 % in comparison with 2018 and is the highest deforestation rate since 2007-2008 (see 10.1126/science.aba3238). It is of the utmost importance to address this, since the trends of emissions from the Brazilian Amazonia are being reverted	Deforestation in Brazil will be considered in SOD	Jorge Hoyos-Santillan	University of Magallanes	Chile

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
1005	7	10	7	12	Fig. 7.2 Shows N2O from livestock. Include also N2O from arable cropping as equally important	fig 7.2 will be improved	David Powlson	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
18127	7	10	7	12	In my view, it is an excellent idea to include such a conceptual figure. However, in my view, such a figure needs to clarify one key distinction that is often confused, i.e. that between stocks and flows. The graph shows both stocks and flows, but does not attempt to distinguish them, which is key in order to reduce confusion, in particular when discussing C effects of changes in land use and land cover. The graph also obfuscates different concepts by mixing a methodological construct (soil C budget) with a process (soil respiration, represented by a very similar box as the former) respectively a complex system (the atmosphere). Also, one has to guess what the green respectively yellow dashed system boundaries are meant to delineate. I recommend to intensively overhaul this figure in order to very clearly distinguish stocks and flows (two incommensurable entities!) and not use similar graphical elements for very different things.	fig 7.2 will be improved including all relevant comments and additional suggestions	Helmut Haberl	Institute of Social Ecology, University of Natural Resources and Life Sciences, Vienna	Austria
28945	7	10	7	12	Sorry, but… what is the function of Figure 7.2? If you forgot to put a paragraph that explain this Figure, please add the paragraph. And don't forget, give the source of the figure.	explanation of figures will be added	Marissa Malahayati	National Institute for Environmental Studies	Japan
46165	7	10	7	12	Nice conceptual figure. N2O and CH4 fluxes from soils are missing. Fertilizers and manure management? What about indirect emissions?	fig 7.2 will be improved including all relevant comments and additional suggestions	Daniel Ortiz-Gonzalo	Department of Geosciences and Natural Resource Management, Faculty of Science, University of Copenhagen	Denmark
39251	7	11	7	11	CH4 and N2O emissions from the land clearing process due to deforestation shouldn´t be taken into account?	fig 7.2 will be improved including all relevant comments and additional suggestions	Roberta Zecchini Cantinho	UNDP / UnB	Brazil
28067	7	11	7	12	Fig 7,2. Please provide the source of the figure if it is not your own production	fig 7.2 is chapter's authors ownership but it can be reported by other authors and then referenced	Alix Frank Rodrigue Idohou	National University of Agriculture	Benin
28779	7	11	7	12	Where did you refer to Figure 7-2? Where did you use this figure in the text?	explanation of figures will be added	Alireza Yazdani	Shiraz University	Iran
38899	7	11	7	12	Fig 7.2. Key AFOLU processes are not included. N2O appears to come from livestock, what about use of chemical fertilizers. CO2 appears to come only from deforestation, how about other land use change or land use processes, including of course peatland degradation and fires	fig 7.2 will be improved including all relevant comments and additional suggestions	francesco tubiello	FAO	Italy
47555	7	11	7	12	Forest harvest is missing from the picture.Deforestation is represented as CO2 emission (although it can also produce wood), but how wood production from regular harvest would be counted in forest (if at all) in not marked. Also, oxidation of wood products is marked in the chart, but not mentioned in the text, which onlly mentions the accumulation of wood products (HWP, as a "sink", which is disputable), but it is not marked in the chart.	fig 7.2 will be improved including all relevant comments and additional suggestions	Zoltán Rakonczay	European Commission, Directorate General for Research	Belgium
12211	7	12	7	12	Fig. 7.2. There are missing linkages and interations and that must be included such as (i) Photosynthesis is occuring across plant types and the movement of biomass and their contribution to C and N sinks/sources, (ii) In case of C budget, the litter from forestry can't be considered alone, and (iii) Animal is the main source of CH4 and N2O is produced/released from its urine and feces depoisted/applied to lands coupling with N fertilizers. So, the conceptural figures must be revised to locate the key sources and the emission types.	fig 7.2 will be improved and includes suggestions	Mohammad Ibrahim Khalil	University College Dublin	Ireland
16843	7	12	7	12	I could not find the reference to this figure in the text.	fig 7.2 is chapter's authors ownership but it can be reported by other authors and then referenced	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
16845	7	12	7	12	I suggest the following caption: "Conceptual figure depicting salient stocks and fluxes of the global carbon cycle". I dont think the 'systems approach' has been touched upon in this chapter.	good comment and it will be considered	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
19965	7	12	7	12	"systems approach": change to "system approach"	corrections will be made	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
32209	7	12	7	12	Fig 7.2: Bottom of the figure: Soil Carbon budget needs to be changed to Soil Carbon. Remove fullstop after the Figure title	corrections will be made	LOKESH CHANDRA DUBE	NATCOM Cell, Ministry of Environment, Forest and Climate Change, Government of India	India
18637	7	14	7	14	Future population growth depends on several factors, with education as one of the main drivers (https://ourworldindata.org/future-population-growth). A reference to the specific source/timescale/scenario can be added for this figure? Or alternatively, a likely range of population size by 2050 (e.g. 8.9 - 10 billion in Lutz and KC (2011) Science “Global Human Capital: Integration Education and Population”)?	references will be added	Charlotte Janssens	KU Leuven	Belgium
19967	7	14	7	14	"with soon 9": suggest changing to "with a population soon reaching 9"	corrections will be made	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
29153	7	14	7	14	"with soon 9 billion people". Soon is too vague. A date could be easily provided	corrections will be made	SMAIL KHENNAS	Energy and Climate Change Consultant	United Kingdom (of Great Britain and Northern Ireland)
40373	7	14	7	14	reference is needed after 9 billion people	references will be added	Gunta Kalvane	University of Latvia	Latvia

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
28947	7	14	7	19	I think you can make this paragraph more concise, like "Along with the rapid increase of the population, management strategy to mitigate the emission is needed..." Please check another paragraph, there are lots of part that can be written more "to-the-point."	corrections will be made	Marissa Malahayati	National Institute for Environmental Studies	Japan
17513	7	14	7	27	Please consider this comment in revising the section: Worldwide 2 billion hectares of grasslands are used for cattle production, of which 1.3 billion can only be grazed and not used for crops for human consumption. Of the 2.5 billion ha needed to produce livestock feed, 77% are grasslands, with a large share of pastures that could not be converted to croplands and could therefore only be used for grazing animals. Overall, 86% of total livestock feed is not suitable for human consumption (Mottet et al 2017). . References Mottet. A., C. de Haan, A. Falcucci, G. Tempio, C Opio and P. Gerber, 2017. Livestock: On our plates or eating at our table? A new analysis of the feed/ food debate. Global Food Security 14 (2017) 1-8 https://dx.doi.org/10.1016/j.gfjs.2017.01001	reference will be read and discussed	Hsin Huang	International Meat Secretariat	France
19969	7	14	7	32	These three paragraphs would require some editing to improve the English. I also suggest deleting the first paragraph, as it has no new information from what has been written earlier in the chapter (apart from the human population data).	finalizing the text will done	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
27271	7	14	7	32	This passage seems to be out of the flow, the para above describes the scope, the subsequent para the objectives. This passage needs to be placed somewhere else.	refinalizing the text will done	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
47557	7	16	7	18	This "sustained" situation could be an ideal steady-state, but the mitigation scenarios imply a strongly non-equilibrium system globally, which is not addressed.	good comment to be discussed and developed	Zoltán Rakonczay	European Commission, Directorate General for Research	Belgium
9473	7	21	7	21	The ecosystem services for a given land systems (particularly for agricultural ecosystems) contain food and fibre production. This comment is also appliable for contents throughout the chapter.	good precision	Minghua Zhou	Institute of Mountain Hazards and Environment, Chinese Academy of Sciences	China
38813	7	26	7	27	I think the previous sentences support the notion that individual management of land from millions of stakeholders has a collective impact on overall biophysical effects. So, there is a sort of spatial scale missing from this sentence in which there are many individual actions that contribute collectively to a larger-scale change in land use, and thus change in biophysical variables.	interesting precision	Julian Reyes	Personal Capacity	United States of America
22139	7	29	7	29	"Nationally Determined Commitments"	meaning NDCs	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
31975	7	29	7	32	when citing countries it will be useful to separate developing countries from first world countries, as some commitements are obligations (Annex I) and others are not (developing countries	such distinction many not be applicable in here	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
1607	7	31	7	31	The number of countries that have pledged to increase sinks is missing	to be specified and added in SOD	Jenkins Rhosanna	University of East Anglia	United Kingdom (of Great Britain and Northern Ireland)
4925	7	31	7	31	XX countries needs to be specified	to be added in SOD	Patrick Lamers	National Renewable Energy Laboratory	United States of America
10577	7	31	7	31	"xx countries have pledged to enhance sinks". The xx should be replaced with a numeric value of sense	to be added in SOD	Wen Zhang	Institute of Atmospheric Physics, Chinese Academy of Sciences	China
19971	7	31	7	31	"xx": add value	to be added in SOD	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
22141	7	31	7	31	"xx" needs to be fulfilled with a figure	to be added in SOD	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
28069	7	31	7	31	What does xx stand for?	to be added in SOD	Alix Frank Rodrigue Idohou	National University of Agriculture	Benin

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
32203	7	31	7	31	Number of countries XX to be changed	to be specified and added in SOD	LOKESH CHANDRA DUBE	NATCOM Cell, Ministry of Environment, Forest and Climate Change, Government of India	India
38617	7	31	7	31	I understand "xx" here is a placeholder to count number based on NDC (without i) will be submitted in 2020. On the other hand, I am afraid some countries always not enable to submit their report by the deadline and so not possible to implement this analysis by the deadline of WGIII report. In this case, some analysis of INDC about sink maybe useful. The existing analysis includes followings Sato and Nogiri 2019, https://doi.org/10.1186/s13021-019-0129-5 Forsell et al. 2016, https://doi.org/10.1186/s13021-016-0068-3	interesting precision and for suggested references	Atsushi Sato	Mitsubishi UFJ Research and Consulting Co.,Ltd.	Japan
39253	7	31	7	31	xx	to be specified and added in SOD	Roberta Zecchini Cantinho	UNDP / UnB	Brazil
39767	7	31	7	31	what is xx?	to be specified and added in SOD	David Manning	Newcastle University	United Kingdom (of Great Britain and Northern Ireland)
44155	7	31	7	31	Can you provide a defined estimate here?	to be specified and added in SOD	Tshepiso Mafole	University of Cape Town	South Africa
46171	7	31	7	31	Remember to change the "xx"	to be specified and added in SOD	Daniel Ortiz-Gonzalo	Department of Geosciences and Natural Resource Management, Faculty of Science, University of Copenhagen	Denmark
14905	7		7		Figure 7.2: Ch4 emissions can be emitted from biomas combustion (besides CO2, N2O and NOx). Non-CO2 emissions can be emitted as well from prescribed burning of biomass on site as a land management practice	fig 7.2 will be improved and includes suggestions	Ana Blondel	Environment and Climate Change Canada / Government of Canada	Canada
18129	7	1	8	7	Even though this is an introductury text, I think that factual statements in such a text need to be backed up by references in an assessment report	needed references will be added but most reported in special reports of IPCC	Helmut Haberl	Institute of Social Ecology, University of Natural Resources and Life Sciences, Vienna	Austria
38685	7	21	8	7	The AFOLU sector includes Agriculture activities not necessarely linked to Land as it is the case of the intensive livestock production. While the scope as introduced seems not to reflect this but rather concentrates only on land use.	Noted, will be reflected in the next draft	Maria Jose Sanz Sanchez	Basque Center for Climate Change	Spain
20155	7	34	8	7	You might consider making this statement in the ES	noted and to be considered	Henry Neufeldt	UNEP DTU Partnership	Denmark
22277	7	1	12	23	What about deserts encorchment and desertification in Africa and Asia (China) which is affecting these regions mainly because of deforestation?	regional breakdown will be the focus in our chapter (SOD)	Noureddine Benkeblia	The University of the West Indies	Jamaica
18837	7	54	54	56	According to the IEA (in UNIDO, 2008), the absolute number of people relying on biomass energy in Africa is also expected to increase between the year 2000 and 2030 - from 583 million to 823 million, an increase of about 27%	new references will be used concerning biomass energy use in different regions and countries	Michael Ugom	University of Nigeria, Nsukka	Nigeria
43959	7	2		9	In your systemic approach it is unclear whether there is a role for biodiversity aspects in mitigation beyond awareness of the associated challenges (noting Boxes 7.1, 7.2 and other parts of the text where the challenges are emphasized)? Such should be elaborated on if information exists (e.g. suggested by case studies). How does the request of setting aside 30% of the land for biodiversity conservation affect your assessment? How would you consider such a request in your analysis?	biodiversity will be considered in further details in SOD	Hans Poertner and Elvira Poloczanska	Alfred-Wegener-Institut	Germany
43189	7	3			what is a policy 'handle'? You use this a lot. Define it here? do you mean 'lever' -- are you using the same metaphor?	Accepted. it will be defined	Deborah Lawrence	University of Virginia	United States of America
43191	7	4			time frame not time scale. Time frame of 2030 or 2050. that is not a time scale.	Accepted. it will be corrected	Deborah Lawrence	University of Virginia	United States of America
21581	7	6			its product? (e.g.....?.)substitute more energy intensive amterial (e.g.....?)	sentence will reformulated and get clear	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
43193	7	6			to what extent is this consistent with past efforts? Please make explicit if this is new and/or acknowledge that ESMs/IAMs don't attribute these emission reductions to the land normally. So this would be different. I think they should be attributed to land, but it isn't so normally, so Just make clear.	sentence will reformulated and get clear	Deborah Lawrence	University of Virginia	United States of America
21583	7	7			biophysical aspect of land management (e.g.....?)	more details will be given	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
6777	7	8			I would suggets rewording " and we include the agriculture emissions as" to "and the agricultureal emissions are included as..."	accepted and sentence reworded	Valasia Iakovoglou	International Hellenic University	Greece
17765	7	10		13	I dont see where is figure 7.2 cited in the text. This is a very simple representation where manyt of the interactions are missing.	fig 7.2 will be improved and comments and suggestions included	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
1391	7	11			Shouldn't Fig 7.2 have a downward area for reforestation/forest growth (ie. LUC) in addition to photosynthesis/CO2 uptake which occurs in all forests (ie. LU)?	fig 7.2 will be improved and comments and suggestions included	Jonah Busch	Earth Innovation Institute	United States of America
3323	7	11			I like this figure :-)!	thanks	Michelle North	University of KwaZulu-Natal (UKZN)	South Africa
43195	7	11			after stating that biophysical will be included, it is not pictured--either in this figure or in a companion figure.	figures will be improved and comments and suggestions included	Deborah Lawrence	University of Virginia	United States of America
3343	7	12			The title of the figure 7,2 is not enough. Is it a conception of the system from economic scope? What is the theoretical background to read the picture?	fig 7.2 will be improved and comments and suggestions included	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
21585	7	12			same with pg. 6 line 38	accepted editorial	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
3325	7	14			"In a world with soon 9 billion people" - could you please indicate what you mean by "soon"? Put a predicted timeframe and cite this (e.g., United Nations Department of Economic and Social Affairs Population Division, 2018. World Urbanization Prospects 2018. https://population.un.org/wup/Download/)	accepted and more details and references will be added	Michelle North	University of KwaZulu-Natal (UKZN)	South Africa
46855	7	14			I suggest to be more specific and provide the estimates for a particular year with uncertainty ranges and a reference.	accepted and references added	Martin Schönhart	University of Natural Resources and Life Sciences, Vienna	Austria
21587	7	16			aimed to…..	Editorial: noted and to be considered	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
10403	7	21			Food, fibre and ecosystem services required from land are not static (that's the whole point of shared socio-economic pathways and demand-side management) - please revise.	it will be revised	Andy Reisinger	NZAGRC	New Zealand
43197	7	22			handles' again. Define above. (or choose a different metaphor)	accepted and it will be changed and defined	Deborah Lawrence	University of Virginia	United States of America
21589	7	24			land support….such as: 1. fisics/abiotic (e.g…..water, etc) 2. biotic (e.g. biodiversity..etc)	noted and to be considered	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
14757	7	25			More clarity is needed for higher agricultural prices. Is it related to input costs or output cost of commercial agriculture	noted and to be considered as context specific	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
3331	7	29			"Nationally determined Commitments" - should these not be "Nationally determined contributions (NDCs)"? Also please provide a citation to the UNFCCC or other source for these	Accepted. it will be corrected	Michelle North	University of KwaZulu-Natal (UKZN)	South Africa
6779	7	30			I would suggest starting the sentence differently, such as "A total of 105 countries have pledged …".	Accepted. it will be corrected	Valasia Iakovoglou	International Hellenic University	Greece
22569	7	30			Replace with the number written out: "One hundred five countries…"	Accepted. it will be corrected	Melissa Lucash	Portland State University	United States of America
17767	7	31		31	xx pending value to be provided	Accepted. it will be corrected	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
3327	7	31			"xx countries have pledged" - don't forget to add the number in	Accepted. it will be corrected	Michelle North	University of KwaZulu-Natal (UKZN)	South Africa
3345	7	31			sign xx?	Accepted. it will be corrected	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
15101	7	31			xx countries: enter required number	Accepted. it will be corrected	Gilbert Ahamer	Environment Agency Austria	Austria
21591	7	31			xx? What countries???	Accepted. it will be corrected	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
22571	7	31			You are missing the number here. Also I'd say "very few details were given…"	Accepted. it will be corrected	Melissa Lucash	Portland State University	United States of America
29927	7	31			Please describe how many countries have pledged to enhance sinks instead of 'xx'.	Accepted. it will be corrected	RAEHYUN KIM	Institute	Republic of Korea
21593	7	34			avoid to use word pronpun such as "we" better this chapter aim to….	Accepted. it will be corrected	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
22573	7	34			Add comma after "short,"	Accepted. it will be corrected	Melissa Lucash	Portland State University	United States of America
21595	7	35			avoid to use word pronpun such as "we" better ….it try to….	Accepted. it will be corrected	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
3329	7				This whole section should surely include more references, whether to literature or to sections in the chapter to follow?	references will be added as suggested	Michelle North	University of KwaZulu-Natal (UKZN)	South Africa
14755	7				Under technological factors head- subhead -agricultural production factor (should have mention of factors eg input cost-- etc--) and the order should be agro technological changes, agricultural production factors and applications in wood sector	figures will be improved and comments and suggestions included	Niveta Jain	ICAR-Indian Agricultural Research Institute	India

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
33145	7				I would suggest to include partnership and international cooperation to develop effective AFOLO sectors and monitoring mechanism for monitoring progress towards mitigation	to be considered	Edris Alam	Rabdan Acadmey	United Arab Emirates
22267	8	25	5	26	Explain this sentence….prices of what?	To be defined	Noureddine Benkeblia	The University of the West Indies	Jamaica
19973	8	1	8	1	"Global Stocktakes": should be " Global Stocktake"	Accepted. it will be corrected	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
19975	8	1	8	1	"concrete": suggest "particular"	Accepted. it will be corrected	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
28949	8	1	8	7	So, you made some research questions. I scroll until the end of the chapter, and can't see where is the answer of this research questions. Do you think you need to put this questions here? I think it is a report document, the section already fixed (cmiiw). Or, if you insist you need it, please coordinate with the other writers so there will be a chapter answering and conclude all of your research questions.	accepted	Marissa Malahayati	National Institute for Environmental Studies	Japan
46857	8	3	8	4	ad "realistic and feasible": This is very much a question of alternative uses and consumption patterns, investment in technology, and many other assumptions. Do you provide a definition of what you consider realistic and feasible, respectively, or do you work with scenarios?	good remark and details will be added to get clear questions	Martin Schönhart	University of Natural Resources and Life Sciences, Vienna	Austria
10405	8	3	8	7	The questions here are very helpful and mostly spot-on, but I don't feel the chapter delivers on them (it certainly does not provide assessment conclusions to those questions). It would help if each section could clarify (internally among the author team, but then even spelled out) what contribution it will make and needs to make to answer those high-level questions, and clarify subsets of questions that it will answer (using confidence/uncertainty language). I also feel the high-level questions are missing aspects of the role of trade (as written the questions given the impression that global outcomes are the sum of local actions), and the role of socio-economic development pathways and demand-side management. These are high-level issues that I feel are worth reflecting at this point to guide the remainder of the chapter.	good remark and details will be added to get clear high level questions. each question should have its section(s) in chapter and discussed according to references used.	Andy Reisinger	NZAGRC	New Zealand
18639	8	5	8	6		not presented	Charlotte Janssens	KU Leuven	Belgium
26839	8	8	8	8	The literature on drivers of LUC is much more developed than what is presented here. I suggest the authors expand the review of literature to capture the changing dynamics of deforestation and deforestation emissions	section on drivers will be developed	Louis Verchot	International Center for Tropical Agriculture	Colombia
47559	8	8	8	8	"Drivers" of what?	land use change	Zoltán Rakonczay	European Commission, Directorate General for Research	Belgium
46183	8	9	8	9	It could be relevant to include findings not only on meat production, but also on feed production. How much land is used for feed versus food. Regional context.	good remark and it will be considered	Daniel Ortiz-Gonzalo	Department of Geosciences and Natural Resource Management, Faculty of Science, University of Copenhagen	Denmark
46185	8	9	8	9	Missing the degree of confidence in the section	good remark and it will be considered as references permit	Daniel Ortiz-Gonzalo	Department of Geosciences and Natural Resource Management, Faculty of Science, University of Copenhagen	Denmark
28951	8	9	8	17	Let's make this paragraph easier to be understand. First, simply state that there are two main driver of land use change: proximate cause and underlying cause. Explain what is the difference between both. Then, mention Figure 7.3	accepted	Marissa Malahayati	National Institute for Environmental Studies	Japan
46487	8	9	8	28	There are no social drivers listed here, such as levels of inequality or political conflict. This assessment of the drivers of deforestation does not take into account more recent literature on 'land sharing' approaches either. See for example: Kremen, C., & Merenlender, A. M. (2018). Landscapes that work for biodiversity and people. Science, 362(6412), eaau6020. https://doi.org/10.1126/science.aau6020	good remark and it will be considered as references permit	Rachel Bezner Kerr	Cornell University	United States of America
19977	8	11	8	11	"modifying and altering them": suggest deleting these words (superfluous; and the 'them' not fitting in the sentence)	Accepted. it will be corrected	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
278	8	12	8	12	Verburg et al 2013 - it s missing the point	Accepted. it will be corrected	Rodrigo Rudge Ramos Ribeiro	Getulio Vargas Foundation	Botswana
33061	8	12	8	12	reference writing style needs to be checked: (Verburg et al 2013).	Accepted. it will be corrected	Mirzokhid Mirshadiev	Wageningen University and Research	Netherlands

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
6263	8	12	8	17	Page 7-8 line 12 starts with 'environment, and for human well-being (Verburg et al 2013)', need to Check the citation,= which is a proper citation (1) without comer or full stop, (2) have a full stop or (3) with a comer. Need to check throughout the chapter for a consistence. See the next comment. Page 7-8 Line 17 (Friis and Reenberg, 2010) see also Page 7-9 line 19 (Curtis et al 2018), Page 7-10 line 21 (Imai et al, 2018), line 49 (Henders et al. 2015) and line 53 (Yao et al. 2018). Which is the correct citation? Check through the document for consistency.	references will be checked	Brown Gwambene	Marian University College	United Republic of Tanzania
6781	8	12	8	17	Please be consistant with the citations and place or not the ",", ex (Verburg et al 2013) and (Friis and Reenberg, 2010)	Accepted. it will be corrected	Valasia Iakovoglou	International Hellenic University	Greece
19983	8	12	8	17	"Human decisions play a crucial role in driving changes in the land system and the dynamic interaction between socioeconomic and biophysical drivers of change (GLP 2005) (Figure 7.3 from van Vliet et al. 2015). The drivers of change are continuously developing due to the complexity of the coupled human-environmental system and the evolution or radical shifts in economic, social, cultural or environmental conditions (Friis and Reenberg, 2010).": suggest changing to "Human decisions play a crucial role in changes in the land system, with a dynamic interaction existing between socioeconomic and biophysical drivers of change (GLP 2005) (Figure 7.3 from van Vliet et al. 2015). Furthermore These drivers are continuously transforming due to shifts in the coupled human-environmental system and radical changes in economic, social, cultural or environmental conditions (Friis and Reenberg, 2010)."	Accepted. it will be corrected	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
19979	8	13	8	14	"and the dynamic interaction between socioeconomic and biophysical drivers of change": suggest " and there is a dynamic interaction between socioeconomic and biophysical drivers of change"	Accepted. it will be corrected	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
40375	8	14	8	14	also biochemical	Noted and newest references will be used.	Gunta Kalvane	University of Latvia	Latvia
280	8	14	8	15	the refence of Figure 7.3 (Van liet et al. 2015), it is diffente of the reference of the figure (Geist and Lambin 2002)	accepted and it will changed as Geist and Lambin (2002) is the correct reference	Rodrigo Rudge Ramos Ribeiro	Getulio Vargas Foundation	Botswana
28953	8	14	8	15	you mention that the figure 7.3 is from Vliet et al, 2015, but on the Figure caption, you mention it is from Geist and Lambin, 2002. Which one is right?	accepted and it will changed as Geist and Lambin (2002) is the correct reference	Marissa Malahayati	National Institute for Environmental Studies	Japan
19981	8	14	8	21	"(Figure 7.3 from van Vliet et al. 2015)" contradicting reference in the figure: "Figure 7.3 Drivers of land use change and cover change (redrawn from Geist and Lambin 2002)"	accepted and it will changed as Geist and Lambin (2002) is the correct reference	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
18131	8	14	8	22	I doubt whether it is useful to rely so strongly on almost 20 year-old conceptualizations of drivers, in particular in the Figure. The IPCC-Special Report Climate Change and Land (2019) was much clearer and better, e.g. p. 90/Fig 1.4 and other material there. I think AR6 needs to go beyond that, not backwards	Noted and newest references will be used. The preparation of figures will be considered.	Helmut Haberl	Institute of Social Ecology, University of Natural Resources and Life Sciences, Vienna	Austria
33063	8	15	8	15	reference writing style needs to be checked : (Vliet et 15 al. 2015).	accepted editorial	Mirzokhid Mirshadiev	Wageningen University and Research	Netherlands
33065	8	19	8	19	reference writing style needs to be checked : (Curtis et al 2018)	accepted editorial	Mirzokhid Mirshadiev	Wageningen University and Research	Netherlands
38901	8	19	8	20	Fig 7.3. I suggest to only have one header: "cultivation'' and have ''shifting cultivation'' as a sub bullet of it. There is no accepted land use definition of shifting cultivatoin, rather this has been a surious term introduced mainyl through the modeling community. Also, ''permanent cultivation'' typically (FAO) points to permament crops, i.e., trees orchards etc.	Noted. The preparation of figures will be considered.	francesco tubiello	FAO	Italy
19985	8	20	8	20	Resolution of Fig 7.3 should be increased	Accepted. it will be edited	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
28955	8	20	8	20	put "underlying cause" in the left side, just like the "proximate causes"	Noted	Marissa Malahayati	National Institute for Environmental Studies	Japan
47561	8	20	8	21	Natural dynamics (such as natural succession on abandoned land) is missing from the figure, although it is arguably the single most important driver of sinks (and the very existence of the sector). It is also missing from the text, which does not cover NPP and its biophysical limitations.	figure will be improved and redrawn	Zoltán Rakonczay	European Commission, Directorate General for Research	Belgium
16847	8	21	8	21	There is no '.' after the figure caption. This is true for some other figures in tis chapter. Also, should it not be 'Figure 7.3: Drivers of ...'? That is, a colon is missing (true for most figures in this chapter).	accepted editorial refined	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
3333	8	22	8	27	This paragraph is unnecessarily wordy, more like a review than an assessment, and could be trimmed substantially to just convey the main message. This will save words!	accepted editorial as paragraph will be refined	Michelle North	University of KwaZulu-Natal (UKZN)	South Africa
19993	8	22	8	27	"A review of econometric studies of the drivers of deforestation that encompassed studies published 1996 and 2013 generated statistics on the consistency with which driver variables are associated with higher or lower rates of deforestation across many analyses and studies (Figure 7.4) (Busch and Ferretti-Gallon, 2017). Higher agriculture prices appear as the driver with higher association with deforestation while law enforcement, protected areas, and payments for ecosystem services were consistently less associated with deforestation.": suggest "Studies analysing the drivers of deforestation show some consistency regarding certain drivers. For example, higher agricultural prices was found to correlate with deforestation in 90% of the econometric studies published between 1996 and 2013, while stronger law enforcement was associated with less deforestation in 90% of these studies (Figure 7.4) (Busch and Ferretti-Gallon, 2017)."	accepted editorial as paragraph will be refined	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
568	8	25	8	27	Sentence not clear... "higher association with deforestation" and "consistently less asociated with deforestation". Please clarify.	accepted editorial as paragraph will be refined	Pierre Bernier	Natural Resources Canada	Canada

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
25753	8	25	8	27	Unclear wording: does this mean 'Higher agricultural prices are the driver most associated with increased deforestation'	accepted editorial as paragraph will be refined	Helen Hughes	University of Edinburgh	United Kingdom (of Great Britain and Northern Ireland)
14759	8	26	8	26	does intensification means agricultural intensification/ cropland intensification,if so should be mentioned here clearly	details will be added	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
33067	8	35	8	35	reference writing style needs to be checked: (Henders et al. 2015)	Accepted and it will be checked	Mirzokhid Mirshadiev	Wageningen University and Research	Netherlands
18133	8	22	9	3	Renarrating one particular study, based on one particular method (econometrics) is not an assessment of the literature. There are large, partly contradictory literatures on these drivers, and it is certainly not an acceptable standard for an assessment report to rely on only one source when discussing such a broad, contested and important issue.	in SOD new references will be looked for and used	Helmut Haberl	Institute of Social Ecology, University of Natural Resources and Life Sciences, Vienna	Austria
27395	8	22	9	3	this passage is all based on one reference - this is hardly in line with the aim of an assessment report. Furthermore, there are plenty studies that analyse drivers of deforestation and land-system change, too many actually to give reference here in the comments. This passage needs thorough revision.	in SOD new references will be looked for and used	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
38687	8	8	14	19	The section on drivers may require more thinking. There seems to be a mix of drives and impact of the drivers. Drivers (labeled by some as underlying causes) are more things like demogrphic changes, economic trends or propensity, technological development, regulation…. A more structured claisfication can help by cascading drivers down from those more genearl ones. Will be possible to go beyond the Geist and Lambin (2002) clasification, giving the changes and information we have form the last two decades will be possible?. There are some interesting thoughts in the paper by Stehfest et al 2019 (Nature Comms, | https://doi.org/10.1038/s41467-019-09945-w)	drivers are discussed in details and suggestions for improvement and complements will be considered. Thanks for proposing reference.	Maria Jose Sanz Sanchez	Basque Center for Climate Change	Spain
28783	8	8	18	26	Drivers, this section is well-written and review all aspects of the topic	Thank you.	Alireza Yazdani	Shiraz University	Iran
18139	8	8	19	13	The storyline of this superimportant section is not clear at all. The section consists of various subsections that follow one after the other without any discernible logic. In my view, this section needs a clear storyline, and in effect needs to be redrafted along this storyline	Accepted. The section will be revised by themes and underlying factors	Helmut Haberl	Institute of Social Ecology, University of Natural Resources and Life Sciences, Vienna	Austria
27397	8	8	19	13	The entire driver section is, unfortunately, not at a decent state for a FOD. It lacks a logic structure, refers only to a highly arbitrary selection of studies, does not reflect upon the starting point the AR5 ch11 and SRCCL provided and does not reflect on the new knowledge added since these reports. Needs a fundamental overhaul.	Accepted. The section will be revised by themes and underlying factors. Additional references will be included and previous reports will be considered.	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
32905	8	8	19	14	This whole section (currently entitled 'Drivers' has a very confusing structure. It requires major rework, for example, by structuring along thematic (deforestation, etc.) or regional (biomes?) changes and underlying drivers.	Accepted. The section will be revised by themes and underlying factors	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
21597	8	1			avoid to use word pronpun such as "we"	Accepted. Text revised.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
46859	8	5			There are trade-offs in any case and at nearly any level. Even reductions in food loss come with costs. To me the question rather is, where the thresholds of socially acceptable compromises are.	Noted. It is a relevant point. Trade-offs are being presented in the different sections.	Martin Schönhart	University of Natural Resources and Life Sciences, Vienna	Austria
46861	8	6			ad "biodiversity": Above, you used the term "ecosystem services". I think the most correct option would be to talk about "biodiversity and ecosystem services" and use this consistently.	Accepted. Text revised.	Martin Schönhart	University of Natural Resources and Life Sciences, Vienna	Austria
21599	8	7			anaother question in new line: what are the costs?	policy and initiative related costs	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
10407	8	8			I'm not convinced that it makes sense to discuss those drivers before emission trends, or at least food production/consumption and fibre/forestry production trends. It risks making the drivers discussion less focused than it could be. A more logical sequence in my view would be food and fibre production and consumption trends, followed by emissions and land use, and only then the socio-economic factors that give rise to those trends.	Accepted. Emissions trends will be presented before the Drivers.	Andy Reisinger	NZAGRC	New Zealand
10423	8	8			I'm missing a dedicated section that discusses to what extent biofuel demand so far has demonstrably affected agricultural land use, food costs, and emissions. There is something on p16 lines 5-15 but this doesn't really go to the heart of those questions. This is a key policy relevant question: what has been the effect of biofuel policies so far on agricultural food production, prices, and (net) emissions?	Accepted. Bioenergy demands will discussed more in the depth in coordination with other chapter and following cross-cutting discussions.	Andy Reisinger	NZAGRC	New Zealand
35113	8	8			Enter	Editorial. Copyedit to be completed prior publication.	Happiness Nnko	The University of Dodoma	United Republic of Tanzania

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
10411	8	9			An important question that the SRCCL only touched on is the question how much of total FOLU emissions can be attributed to agriculture. It would be extremely helpful if this assessment could provide a clear answer to this (with uncertainty and confidence of course - not a single number; perhaps also regional differentiation, and explanation of proximate and ultimate drivers through sequential land-use change).	Accepted. More information will be included on this question.	Andy Reisinger	NZAGRC	New Zealand
21601	8	12			et al.	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
35115	8	12			Verburg et al. 2013 instead of Verburg et al 2013	Editorial. Copyedit to be completed prior publication.	Happiness Nnko	The University of Dodoma	United Republic of Tanzania
21603	8	14			socio-economi- and (GLP, 2005)	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
15103	8	17			Suggestion to add after end of sentence: "Several evolutionary theories were suggested to explain long-term trends in the global AFOLU system, among which a consecutive series of societal needs being satisfied one after the other during historic development and hence exhibiting a sequence of sigmoid trends; named 'blossoming evolution' (Ahamer, 2019)." -- The reference is: Ahamer, G. (2019), Mapping Global Dynamics - Geographic Perspectives from Local Pollution to Global Evolution. Springer, Dordrecht. (ISBN 978-3-319-51702-5, 426 pp., relevant chapters are 7, 20 and 22; see https://www.springer.com/de/book/9783319517025)	Thank you for the suggestion of your paper. The current text already covers the links with societal needs.	Gilbert Ahamer	Environment Agency Austria	Austria
21605	8	21			fig. 7.3. source: Geist and Lambia, 2002)…have athers newest literature?	Figure will be revised and updated although most of the information presented is still valid.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
46863	8	21			This work by Geist and Lambin is about tropical deforestation. I think the caption needs to highlight this since the specific arguments in the figure do not make sense in a general context. Alternatively or even better, you may provide more general arguments on drivers of land use change.	Figure will be revised and updated to cover a broader spectrum.	Martin Schönhart	University of Natural Resources and Life Sciences, Vienna	Austria
22575	8	25			Change to “Higher prices for agriculture tend to drive greater rates of deforestation”	Editorial. Copyedit to be completed prior publication.	Melissa Lucash	Portland State University	United States of America
43199	8	27			less associated' is not the same a negatively associated. Which is it? looking at figure, it still looks positively associated, unless there is something special about the 0.5 value. This is a strange finding as written/expressed in the figure. Wouldn't it make more sense if some factors resulted in LESS deforestation and some resulted in MORE? or is it true that all factors are positively associated with deforestation?	Authors of the paper were contacted and provide a revised figure with an improved design.	Deborah Lawrence	University of Virginia	United States of America
12213	9	17	7	26	Urbanization/households with population growth in developing worlds should also consider.	Accepted. Urbanization will be more emphasized.	Mohammad Ibrahim Khalil	University College Dublin	Ireland
20	9	8	8		What are extratropical regions? clarify	Occurring outside the tropics, usually in temperate latitudes.	Stella Kabiri-Marial	National Agricultural Research Organisation	Uganda
44157	9	0	9	0	Please provide a high resolution image. Some of the texts in this, is blurry.	Noted. Figures will be revised for the next draft.	Tshepiso Mafole	University of Cape Town	South Africa
12035	9	1	9	1	This is a very important figure. Please consider the following suggestions to make it easier to read. 1) Increase the size. 2) Explain the use of colors in the bars.	Noted. Figures will be revised for the next draft.	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
28957	9	1	9	1	What is the unit of x-axis?	Noted. Figures will be revised for the next draft.	Marissa Malahayati	National Institute for Environmental Studies	Japan
29155	9	1	9	2	Fig 7.4 is useful. Please explain the scale	Authors of the paper were contacted and provide a revised figure with an improved design.	SMAIL KHENNAS	Energy and Climate Change Consultant	United Kingdom (of Great Britain and Northern Ireland)
12171	9	1	9	3	This figure is very esay to read - please keep!	Thank you.	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
17251	9	1	9	3	Please explain what the equation (?) below the graph should indicate. What is represented by the "#"?	Noted. Figures will be revised for the next draft.	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany
19795	9	1	9	3	The meanining of some of the driver variables can only be guessed f.e timber activity, greater soil suitability (suitability for what ?), wetter (Soil or site or climate?)	Authors of the paper were contacted and provide a revised figure with an improved design. Additional information will be provided in the text.	Michael Englisch	Austrian Research Centre for Forests	Austria
19987	9	2	9	2	Resolution of Fig 7.4 should be increased	Noted. Figures will be revised for the next draft.	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
19989	9	2	9	2	The x axis of Fig 7.4 could be better if instead of "#" it said "number of studies"	Noted. Figures will be revised for the next draft.	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
19991	9	2	9	2	Some categories on the y axis of Fig 7.4 does not show the direction of change. These should be added (e.g. law enforcement: stronger or weaker? Protected area: more or less? Community forestry: more or less? Agricultural activity: mmore or less?	Noted. Figures will be revised for the next draft.	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
28071	9	2	9	2	Figure 7,4 needs improvement	Noted. Figures will be revised for the next draft.	Alix Frank Rodrigue Idohou	National University of Agriculture	Benin
47563	9	2	9	3	Figure 7.4: what does "association" mean? Is it correlation? Negative correlation is also correlation. Does zero association imply irrlelevance?	Noted. Figures will be revised for the next draft.	Zoltán Rakonczay	European Commission, Directorate General for Research	Belgium

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
28959	9	4	9	8	It took time for me to understand the passage. So, you want to say that based on the satellite figure, the tropical area experiencing tree cover loss, while the extratropical experiencing three cover gain? Isn't it? Please make it more concise, and could you define what is extratropical forest is? If it is include all forest excluding the tropical forest, of course it will be get net-gain. But if you divide it into more detail, I believe that there is not only the tropical area experiencing the net loss, but also other type of the forest.	Accepted. Text will be revised in order to make it clearer.	Marissa Malahayati	National Institute for Environmental Studies	Japan
22	9	5	9	15	The study by Song et al, 2018 shows that global tree cover has increased from 1982-2016, but authors need to show more literature to support this trend. For instance, where in between 1982 and 2016, did we start to see this positive trend? This would strengthen the argument that the small contributions to afforestation is showing results	Noted. If possible, more detail will be added considering the large scale of the study of Song et al.	Stella Kabiri-Marial	National Agricultural Research Organisation	Uganda
18135	9	5	9	36	In my view, this fails to meet the standards for an assessment. This section discusses an enormously important issue, yet the whole material consists of three paragraphs, each renarrating one individual study, while of course there are abundant literatures on all the issues discussed here. My expectation for an assessment would be to identify key statements and then review the whole (or at least a large fraction) of the pertinent literature, and draw conclusions on that basis. Similar problems refer to the next section...	Accepted. Text will be revised to include other studies.	Helmut Haberl	Institute of Social Ecology, University of Natural Resources and Life Sciences, Vienna	Austria
19191	9	5	9	36	This section requires charts or graphs to clearly illustrate the land-use changes. Just citing numbers in some publications does not serve the readers and decision makers.	Noted. The preparation of figures will be considered.	Cheah Singfoong	Independent consultant, formerly more than 10 years with the National Renewable Energy Laboratory, USA	United States of America
19195	9	5	9	36	A summary of this section is necessary, e.g., global tree cover has increased (first paragraph) but forest loss has been going on at a steady rate for the x number of years (2nd paragraph) and agricultural commodities production has increased (3rd paragraph). Therefore, the increased tree cover is actually from agricultural land (that is the way I concluded, but I am not sure what is the authors' main point).	Accepted. Text will be revised in order to make it clearer.	Cheah Singfoong	Independent consultant, formerly more than 10 years with the National Renewable Energy Laboratory, USA	United States of America
38903	9	6	9	8	If you have a chapter titles ''land use change'', it is odd that it starts with a quantification of changes in ''tree cover'', which is not a land use change in the sense of IPCC, UNFCCC, NGHGI, whatever angle this chapter should choose to adhere to. Tree cover is a lnad cover attribute, not a land use attribute. If the text starts with such an odd description of land cover change, then some explanatory language of why this is brought in and how it relates to lans use change (it hardly does) shold be written.	Accepted. These distinctions will be included in the section.	francesco tubiello	FAO	Italy
19193	9	6	9	15	For such an important conclusion, is there no other reference/source?	Accepted. Text will be revised to include other studies.	Cheah Singfoong	Independent consultant, formerly more than 10 years with the National Renewable Energy Laboratory, USA	United States of America
25755	9	6	9	15	Suggest that this paragraph should explicitly reference greening of the arctic, assuming it is included in the numbers stated.	Noted, references will be added.	Helen Hughes	University of Edinburgh	United Kingdom (of Great Britain and Northern Ireland)
27273	9	6	9	15	Data on forest / tree cover change are highly uncertain. Only refering to Song et al. in such a passage is a step back over the available literature and the assessment in SRCCL. More references are needed here, e.g. 10.1126/science.1244693, https://doi.org/10.5194/essd-10-219-2018, but a reference to the forest resource assessment is also needed, which is a benchmark datasource for the best practice guidelines (see later in the text of ch7), also the New York Declaration on Forests 2019. The text should also make clear that a change in tree cover is not identical with a change in forest cover (which is part of a conceptual uncertainty). Otherwise, the passage will be misleading	Accepted. Text will be revised to include other studies.	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
43339	9	6	9	15	Song et al. is based on MODIS, whose resolution does not allow to draw robust conclusion on global land use change,. This should be noted	Accepted. Text will be revised to include other studies.	Giacomo Grassi	Joint Research Centre, European Commission	Italy
10409	9	6	9	26	The first para here says that globally tree cover has increased, while the second para talks about global forest loss. Clarify if those two statements are consistent and if they are, please explain how to avoid confusion	Accepted. These distinctions will be included in the section.	Andy Reisinger	NZAGRC	New Zealand
46225	9	6	9	26	Global land use changes. Assessment of the extent of forest cover and ignoring relative condition is inadequate. The FAO distinguishes between three broad categories of forest condition (2018): (i) primary forests (CBD/FAO). (ii) production forests used for commercial logging but still reliant on selective natural regeneration and (iii) plantation forests predominantly composed of trees established through planting or deliberate seeding of commercial varieties including exotic and monoculture species. Recent mapping of forest condition for Tropical biomes and the implications for stable carbon storage and mitigation value is dicussed in Mackey et al 2020, 'Understanding the importance of primary tropical forest protection as a mitigation strategy', Mitigation and Adaptation Strategies for Global Change	Accepted. These distinctions will be included in the section.	Virginia Young	Australian Rainforest Conservation Society, Griffith University, CAN Ecosystems	Australia
1609	9	7	9	7	al' missing in the reference for Song et al., 2018	Editorial. Copyedit to be completed prior publication.	Jenkins Rhosanna	University of East Anglia	United Kingdom (of Great Britain and Northern Ireland)

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
47565	9	7	9	8	The "tree cover" figure shoudl be explained (is it the same as forest cover, or how it is different), critically evaluated and a confidence interval given.	Accepted. These distinctions will be included in the section.	Zoltán Rakonczay	European Commission, Directorate General for Research	Belgium
38905	9	9	9	10	Same comment as above: what do changes in bare land have to do with land use change?	Accepted. These distinctions will be included in the section.	francesco tubiello	FAO	Italy
38907	9	11	9	12	Similar to above: in IPCC/UNFCCC/NDC world, land use change is by definition anthropogenically driven --indirect effects and natural effects are not to be included in the computation of emissions/removals. Something should be said in the text to this end.	Accepted. These distinctions will be included in the section.	francesco tubiello	FAO	Italy
9873	9	17	9	22	This statement is very different from older evidence that agriculture and livestock rearing was by and large the dominant primary drivers of deforestation, with shifting agriculture and wood harvest having a much minor role (eg. (Armenteras et al., 2017; Geist and Lambin, 2002; Hosonuma et al., 2012)). A justification of why the single quoted study is sufficient to falsify past evidence is necessary to support the statement. Moreover, it is unclear how forestry can be a driver of deforestation: intuitively, one understands that in most cases, forest management/plantation can replace/degrade natural forests, but not drive deforestation. Do you mean forest roads? Do you mean that wood sales are important in paying for the transaction cost from forest to another land-use? May be you meant "[…] indicated that only 27% of global forest loss can be attributed to deforestation through permanent land use change for commodity production. The remaining areas maintained the same land use regrows into forest within over 15 years; in those areas, temporary forest loss was attributed to forestry (26%), shifting agriculture (24%), and wildfire (23%)." If so, I recommend the above editorial changes to avoid misunderstandings.	Accepted. Text will be revised to include other studies.	Valentin Bellassen	INRAE	France
570	9	17	9	26	I would strongly suggest not using the misleading term « FOREST LOSS » anywhere in this chapter, unless when talking about a permanent change in land use. Both the IPCC and the FAO definitions of "forest" contain the concept of a potential to reach pre-defined values of canopy height and cover density. Hence, the term "forest loss" implies the loss of this potential, which is false in cases of natural disturbances, sustainable forest management, and possibly for shifting cultivation practices. What remote sensing sees very well is a "loss of tree canopy cover" (my preferred term), usually from an abrupt event. What it does not see very well is the recovery of tree canopy cover from tree regrowth unless the study spans enough time to detect the change. The global study of Hanson et al (2013) missed most post-disturbance forest regrowth in Canada for that reason (Guindon et al, 2018 doi:10.1002/ecs2.2094), resulting in misleading interpretation of forest management outcomes by third parties. Also, caveats about the results of remote sensing studies, however incomplete, are only found many pages later (P.23, l. 14-17). I would suggest making such caveats also in this section so that remote sensing results on land cover change are not interpreted as being permanent land use changes.	Accepted. These distinctions will be included in the section.	Pierre Bernier	Natural Resources Canada	Canada
17253	9	17	9	26	Pkease be more explicit in the wording you use here. Deforestation is a change in land use, wildfires and forest cover loss due to forestry means tree cover loss due to e.g. clearcut harvest and subsequent revegetation with (forest) trees. Both (fire and harvest) are not to be considered land use change and care shouldbe taken to prevent misunderstandings in this regard.	Accepted. These distinctions will be included in the section.	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany
26841	9	17	9	26	I am not sure this makes sense. Forestry typically does not lead to forest loss, although it leads to emissions. Land use for forestry involves forest regrowth following harvest, typically. Also, attributing forest loss to shifting cultivation does not make sense. At the landscape scale, shifting cultivation should give near net zero emissions as fallows regrow. Contrast this articulation of tropical forest loss with that of Hosonuma (2012 in ERL) or De Sy (2019, ERL). It would be good for this section to resolve the differences in findings between authors.	Accepted. Text will be revised to include other studies.	Louis Verchot	International Center for Tropical Agriculture	Colombia
27275	9	17	9	26	This para lacks assessment style and uncertainty language, there is a body of literature that could be included, e.g. 10.1371/journal.pone.0181202	Accepted. Text will be revised to include other studies.	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
38909	9	17	9	26	The problem with data from remote sensing is that they cannot capture land use but they do capture land cover change. The text becomes then quickly unbiguous, considering that the focus of a chapter in WGIII on AFOLU should adhere to the IPCC definitions of land use change and not to other, scientifically valid but inconsistent with IPCC< definitions that depend on land cover. As an example, the text first starts off with 'global forest cover'' change (but it is reallt changes in tree cover, since this is the only thing that a satellite can see), then it informs us that apaprt fro m27% due to deforestation, the remainder is not land use change at all, since teh land use remians forestry (and hardly forest fires--except in the recent extreme cases we are now seeing including australia), are directly assocaited with land use chage --unless forest is being burned as part of the deforestaton process.	Accepted. These distinctions will be included in the section.	francesco tubiello	FAO	Italy
47567	9	20	9	20	"Deforestation" implies "permanent" LUC by definition. If not, it should be explained.	Noted. Text will be revised	Zoltán Rakonczay	European Commission, Directorate General for Research	Belgium
16613	9	21	9	21	it Would be good to mention livestock as they are often a direct user after D4 station or they take over after several years of cropping when the fertility is reduced to a point that cropping does not continue	Thanks for the comment, but due to space limitations we can´t provide such detailed description.	Bruce McCarl	Texas A & M University	United States of America
16851	9	21	9	21	in those areas, loss was attributed to forestry' should be ''in those areas, forest loss was attributed to forestry'. Hence, it is much clearer.	Editorial. Copyedit to be completed prior publication.	Ranjith Gopalakrishnan	University of Eastern Finland	Finland

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
19995	9	21	9	26	The text is confusing. "The remaining areas": does it refer to forest areas which didn't change or the remaining 73% of the forest loss (which was not attributed to commodity production but something else)? "loss was attributed to forestry": how forest loss could be attributed to forestry? This would need a bit of an explanation (e.g. shorter rotation cycle can be a reason, but it sounds counterintuitive without further explanation).	Accepted. Text will be revised to make it clearer.	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
9671	9	22	9	25	The statement is incomplete in a sense that the geographic shift away from Latin America is also resulting in an increasing deforestation and agriculture expansion in Africa, in fact the increase agriculture driven deforestation and related emissions between 1990 and 2015 has been largest in Africa:, see: S Carter, M Herold, V Avitabile, S de Bruin, V De Sy, L Kooistra, ... 2018. Agriculture-driven deforestation in the tropics from 1990–2015: emissions, trends and uncertainties, Environmental Research Letters 13 (014002)	Accepted. Reference will be included.	Martin Herold	Wageningen University	Netherlands
19797	9	23	9	26	It is not clear, why a standard error is given for the forest loss due to intensification and expansion of urban centers, while on top of this paragraph the standard error is not given in relation to much bigger values.	Noted. Text will be revised.	Michael Englisch	Austrian Research Centre for Forests	Austria
16853	9	24	9	24	Year-1. The '-1' should be superscripted.	Editorial. Copyedit to be completed prior publication.	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
19997	9	24	9	24	"year–1": -1 as superscript	Editorial. Copyedit to be completed prior publication.	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
22143	9	24	9	25	Subscript on "-1" and the use of a period after the word "Asia"	Editorial. Copyedit to be completed prior publication.	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
19999	9	25	9	25	"Asia An": full stop after Asia	Editorial. Copyedit to be completed prior publication.	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
28073	9	25	9	25	Full stop after South Asia	Editorial. Copyedit to be completed prior publication.	Alix Frank Rodrigue Idohou	National University of Agriculture	Benin
39575	9	25	9	25	Insert ".".	Editorial. Copyedit to be completed prior publication.	Marylin Bejarano Castillo	National Water Comission of Mexico	Mexico
22269	9	28	9	28	explain what you mean by commercial agricultural goods. All produce are comemrcial.....at different scales	Noted. Explanation will be added.	Noureddine Benkeblia	The University of the West Indies	Jamaica
9875	9	28	9	36	Righ above (see previous comment) you state that commodities are responsible for 27% of deforestation. Here, only four commodities are responsible for 40%. Providing a range rather than two apparently contradictory statements would be preferable.	Thank you. Numbers will be checked.	Valentin Bellassen	INRAE	France
13421	9	28	9	36	Argentina's congress passed a forest law that went into effect in 2009. The law recognises the environmental services provided by forests and instructs the provinces to carry out land-use planning and zoning in their forested areas, according to three categories. Red areas are those of high conservation value that should not be transformed; yellow ones have medium value and can be used for sustainable activities; and green ones have low conservation value and can be transformed. Argentina's 23 provinces have already completed this process for a total of about 54 million hectares of forest, approximately 19 percent of the country's land area. The South America's second largest forest mass called "The Gran Chaco", two thirds of which lies in Argentina (130 million acres). The Chaco's massive forests harbor incredibly rich ecosystems that help the planet mitigate climate change whilst sheltering unique vegetation and wildlife including 3,400 plant species, 500 bird species, 150 mammals, 120 reptiles and some 100 amphibians. Total area deforested now under agricultural production is 0.11% of total Gran Chaco. GRAIN VALUE CHAIN is working to reach a COMMITMENT TO REACH ZERO DEFORESTATION BY 2023. This information is now public in https://soja.agroideal.org/ar/, a private sector effort to contibute to climate change. This improves traceability, so it allows to enterprises, consumers and stakeholders to avoid purchases from areas that were deforested	Thank you for the suggestion of your paper. The current text already covers the links with societal needs.	Nelson Illescas	Fundación INAI - Bolsa de Cereales de Buenos Aires	Argentina
26843	9	28	9	36	Why is this assessment based on a single paper? There is a braoder literature on this. See the work of Patrick Meyfroidt, Ruth DeFries, Eric Lambin, Veronique De Sy and others.	Accepted, the text will be revised and new references will be added.	Louis Verchot	International Center for Tropical Agriculture	Colombia
27277	9	28	9	36	other literature: 10.1016/j.gloenvcha.2019.03.002, 10.1088/1748-9326/ab0d41, 10.1038/s41559-019-0824-3	Accepted, the text will be revised and new references will be added.	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
11267	9	28	9	37	Not sure if this is updated how representative is the data from only seven countries?? The periodreferred ins 200-2011which I think needs to update the figures is old an has to be revised, make sure it represents the world not only seven countries. The last sentence need completion something seems to be missing	Accepted, the text will be revised and new references will be added.	Mahmood Riyaz	Maldivian Coral Reef Society	Maldives
9769	9	29	9	29	Rephrase the concept of teleconnections. This might not show the same level of understanding for all readers.	Editorial. Copyedit to be completed prior publication.	Jeanne Bormann	Ministry of agriculture	Luxembourg

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
35885	9	29	9	29	The chapter mentions teleconnection or telecoupling, but does not treat the issue further. Telecoupling is becoming an increasingly relevant issue in the land use and climate discussion, scientifically and politically. It may be so that telecoupling is treated in other chapters, but it is paramount that it is treated somewhere in the AR6. Since AR5 interesting and relevant research has been published see e.g.	Accepted, the text will be revised and new references will be added.	Niclas Scott Bentsen	University of Copenhagen, Department of Geosciences and Natural Resource Management	Denmark
35887	9	29	9	29	Bruckner, M., et al. (2015). "Measuring telecouplings in the global land system: A review and comparative evaluation of land footprint accounting methods." Ecological Economics 114: 11-21; Eakin, H., et al. (2014). Significance of telecoupling for exploration of land-use change. Rethinking global land use in an urban era, MIT Press; Fang, B., et al. (2016). "Energy sustainability under the framework of telecoupling." Energy 106: 253-259; Liu, J., et al. (2015). "Multiple telecouplings and their complex interrelationships." Ecology and Society 20(3); Liu, J., et al. (2014). Applications of the telecoupling framework to land-change science. Rethinking global land use in an urban era, MIT Press; Tonini, F. and J. Liu (2017). "Telecoupling Toolbox: spatially explicit tools for studying telecoupled human and natural systems." Ecology and Society 22(4). Look also at the research being conducted at the Coupled project http://coupled-itn.eu/.	Thank you for the suggested references. The text will be revised and new references will be added.	Niclas Scott Bentsen	University of Copenhagen, Department of Geosciences and Natural Resource Management	Denmark
46491	9	31	9	31	This assessment of key commodities driving deforestation should go into more recent studies and not rely on just one source. Sugar cane for example is another important commodity driving deforestation in Indonesia, see: Obidzinski, K., Kusters, K., & Gnych, S. (2015). Taking the Bitter with the Sweet: Sugarcane's Return as a Driver of Tropical Deforestation. Conservation Letters, 8(6), 449–455. https://doi-org.proxy.library.cornell.edu/10.1111/conl.12172	Accepted, the text will be revised and new references will be added.	Rachel Bezner Kerr	Cornell University	United States of America
9771	9	35	9	36	Part of the sentence seems to be missing.	Editorial. Copyedit to be completed prior publication.	Jeanne Bormann	Ministry of agriculture	Luxembourg
20001	9	36	9	36	"evidenced that the growing influence of global markets in deforestation dynamics": suggestion "showed evidence that global markets have a growing influence in deforestation dynamics"	Editorial. Copyedit to be completed prior publication.	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
22145	9	36	9	36	The word "evindenced that"	Editorial. Copyedit to be completed prior publication.	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
15125	9	44	9	44	more a demand factor than a trade factor, due to large meat demand more feedstaff imported	Noted.	Bettina Rudloff	German Institute for foreign and security affairs (SWP)	Germany
3335	9	1			If you adapt this figure for your own use, I recommend making it easier to understand - which is better? How does one read this graphic? If you do it, I would redo the x-axis to represent something like more deforestation on the left to less deforestation on the right, and have the strength of association shown some other way. Consult a graphics officer for ideas - at the moment this is a highly academic figure that needs text to explain how to interpret it, which is not idea for an IPCC assessment report.	Authors of the paper were contacted and provide a revised figure with an improved design.	Michelle North	University of KwaZulu-Natal (UKZN)	South Africa
1393	9	2			In figure 7.4 grey bars are not statistically significant while white and black bars are	Authors of the paper were contacted and provide a revised figure with an improved design.	Jonah Busch	Earth Innovation Institute	United States of America
1395	9	6			why not include Hansen et al 2013 here too for forest cover loss, Kim et al 2015 for forest area changes, and Liu et al 2015 for biomass changes	Thank you for the suggested references. The text will be revised and new references will be added.	Jonah Busch	Earth Innovation Institute	United States of America
6783	9	7			(Song et 2018) must be (Song et al., 2018). Please checkand apply properly this throughout the chapter because it is repeated.	Editorial. Copyedit to be completed prior publication.	Valasia Iakovoglou	International Hellenic University	Greece
21607	9	7			Song et al.	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
22577	9	7			Move "globally" to after km2.	Editorial. Copyedit to be completed prior publication.	Melissa Lucash	Portland State University	United States of America
35117	9	7			(Song et al. 2018) instead of (Song et 2018)	Editorial. Copyedit to be completed prior publication.	Happiness Nnko	The University of Dodoma	United Republic of Tanzania
43201	9	8			grammar	Editorial. Copyedit to be completed prior publication.	Deborah Lawrence	University of Virginia	United States of America
21609	9	9			the same study with who???	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
22579	9	10			Change to "of Asia."	Editorial. Copyedit to be completed prior publication.	Melissa Lucash	Portland State University	United States of America
22581	9	11			Add comma after drivers	Editorial. Copyedit to be completed prior publication.	Melissa Lucash	Portland State University	United States of America
22583	9	12			Change to "Trends in land-use differ regionally, with deforestation and agricultural expansion dominating in the tropics and… dominating in the temperate zones."	Editorial. Copyedit to be completed prior publication.	Melissa Lucash	Portland State University	United States of America
22585	9	14		15	I think the sentence that starts with "the mapped" is a little unclear and could be omitted since I'm not sure what it adds to the paragraph.	Editorial. Copyedit to be completed prior publication.	Melissa Lucash	Portland State University	United States of America

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
21611	9	17		20	where this study was conducted? Curtis et al.	Noted. Information will be added.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
22587	9	17			It takes 3 lines to get to the verb. Simplify to: Based on satellite imagery with a classification model, it was determined that 27% of global forest loss can be attributed to deforestation through permanent land use change for commodity production (Curtis et al 2018).	Editorial. Copyedit to be completed prior publication.	Melissa Lucash	Portland State University	United States of America
35119	9	19			(Curtis et al. 2018) instead of (Curtis et al 2018)	Editorial. Copyedit to be completed prior publication.	Happiness Nnko	The University of Dodoma	United Republic of Tanzania
22589	9	21			I would omit the word “loss” and say disturbance, because the land use was constant. Actually I’m not sure if you need these figures because you are discussing land use change and not other disturbances.	Noted. Text will be revised.	Melissa Lucash	Portland State University	United States of America
21613	9	24			year-1	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
3347	9	25			a dot is missing	Editorial. Copyedit to be completed prior publication.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l’environnement	France
6893	9	25			"America and Southeast Asia An additional " add ".", So, America and Southeast Asia. An additional "	Editorial. Copyedit to be completed prior publication.	Valasia Iakovoglou	International Hellenic University	Greece
21615	9	25			Asia. An add…..	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
43203	9	25			how does 0.6% relate numerically to 5 M ha? What percent is the 5 M ha? Hard to understand the use of these specific numbers without more context	Accepted, the text will be revised and improved.	Deborah Lawrence	University of Virginia	United States of America
43205	9	29			the word 'teleconnection' has very specific meaning for the biophysical effects of forests on climate, and for atmospheric dynamics in general where a change in one region/hemisphere can have an impact remotely (in another region/hemisphere). Not sure what is meant here, but best not to use this particular word.	Noted, the concept will be clarified.	Deborah Lawrence	University of Virginia	United States of America
22591	9	30			Omit “the quantification of”. Change to: “Deforestation and the carbon emissions from LUC induced by the production and the export of four commodities (beef, soybeans, palm oil, and wood products) in seven countries with high deforestation rates (Argentina, Bolivia, Brazil, Paraguay, Indonesia, Malaysia, and Papua New Guinea) were responsible for 40% of total tropical deforestation and resulting carbon losses between 2000–2011 (Henders et al. 2015). The growing influence of global markets on deforestation dynamics was evident by comparing 2000 and 2011.”	Editorial. Copyedit to be completed prior publication.	Melissa Lucash	Portland State University	United States of America
1397	9	35			for a more recent citation covering a wider suite of countries that builds on Henders et al see Pendrill et al 2019	Thank you for the references. They will be added to the text.	Jonah Busch	Earth Innovation Institute	United States of America
3349	9	36			"that" must be erased	Editorial. Copyedit to be completed prior publication.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l’environnement	France
35121	9	36			Delete the word that	Editorial. Copyedit to be completed prior publication.	Happiness Nnko	The University of Dodoma	United Republic of Tanzania
17255	10	1	10	13	Please do not mix temporary forest cover loss and deforestation.	Accepted. The text will be revised.	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany
11269	10	1	10	42	Not sure if this is representing all the regions of the world, only south Asia and Latin America figures were given, and smaller regions such as islands are not addressed at all AFOLU is islands are significance in island scale and it has to be addressed	Accepted. The text will be revised to include more information about islands.	Mahmood Riyaz	Maldivian Coral Reef Society	Maldives
27279	10	1	10	42	The semantic differnce of tree cover (first para, a page before) and forest cover needs introduciton there to prevent misinterpretations. Furthemore, the title refers to patterns, but discussed are drivers and patterns without good structure. Quantitave informations is anecdotal, needs to turn to assessement style/uncertainty language. Revision required.	Accepted. The text will be revised.	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
1493	10	2	10	3	Is "forestry" a driver of forest loss? I treat forestry as a sector, but not a driver for loss of forest.	Accepted. The text will be revised.	JUNGUO LIU	Southern University of Science and Technology	China
12215	10	2	10	3	Forestry can't be the dominant disturbance factor but deforestration and relevant, need to rephrase.	Accepted. The text will be revised.	Mohammad Ibrahim Khalil	University College Dublin	Ireland
572	10	3	10	4	Apparent contradiction bewteen this sentence on tropical regions, and the sentence at lines 22-23 on central and south-America	The text will be revised to make it clearer.	Pierre Bernier	Natural Resources Canada	Canada
574	10	4	10	8	partial repeat of information found p. 9, l. 28-29	Editorial. Copyedit to be completed prior publication.	Pierre Bernier	Natural Resources Canada	Canada
9665	10	4	10	8	The proper reference for this statement should be: N Hosonuma, M Herold, V De Sy, et al., ... 2012. An assessment of deforestation and forest degradation drivers in developing countries. Environmental Research Letters 7 (4), 044009	Editorial. Copyedit to be completed prior publication.	Martin Herold	Wageningen University	Netherlands
9877	10	4	10	10	The statement is correct but it's a pity to focus on a single study and a single number. I would recommend considering at least the following other references to strengthen the evidence and change the "73%" into a range: (Armenteras et al., 2017; Geist and Lambin, 2002; Hosonuma et al., 2012).	Thank you for the references. They will be added to the text.	Valentin Bellassen	INRAE	France

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
16857	10	7	10	7	De Sy 2016': This is a Phd thesis. It would be better to use a journal paper.	Noted, the reference will be replaced by peer-reviewed paper.	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
26845	10	7	10	7	Update to De Sy (2019) in ERL. This section is on regional drivers, while global drivers was discussed in an earlier section. I suggest citing the global figures from this paper in that earlier section and the regional figrures here	Thank you, reference will updated.	Louis Verchot	International Center for Tropical Agriculture	Colombia
46493	10	7	10	9	Explain / define the terms local/subsistence vs commercial, and again there should be more than 1 reference here; not sure of the confidence level of the attribution of deforestation to small-scale subsistence vs commercial	Accepted, the text will be revised and more references will be included.	Rachel Bezner Kerr	Cornell University	United States of America
46495	10	7	10	27	Assessment of a broader range of literature needed to determine the main drivers of deforestation (ie subsistence ag vs commercial) globally, not just one study from 2016.	Accepted, the text will be revised and more references will be included.	Rachel Bezner Kerr	Cornell University	United States of America
39255	10	9	10	10	"The other important land use is local/subsistence agriculture, which accounts for 33% of deforestation." - Reference?	Editorial. Copyedit to be completed prior publication.	Roberta Zecchini Cantinho	UNDP / UnB	Brazil
10413	10	10	10	10	The statement that agriculture causes 73% of all deforestation is not consistent with the SPM of SRCCL. Please clarify whether you are modifying SRCCL conclusions here or why this is different (SRCCL SPM table 1, reproduced as Table 7.1 in this chapter, gives 4.9 out of 5.2 Gt CO2 as attributable to agriculture). Either way if this is intended as global statement it belongs in the previous section and is quite an important and highly policy-relevant finding that should be elevated in its visibility.	Accepted, the text will be revised.	Andy Reisinger	NZAGRC	New Zealand
9773	10	12	10	13	Further explain why the deforestation practice in Africa might change in the coming years and to which extent	If, available, further information will be added.	Jeanne Bormann	Ministry of agriculture	Luxembourg
29157	10	12	10	13	Biomass for energy (firewood and charcoal) and bushfires for agriculture purposese are also important drivers of deforestation in sub-Saharan Africa. However lines 36-41 page 10 are dealing with this issue. Just a need a consistency between the two paragraphs	Noted, this will be addressed.	SMAIL KHENNAS	Energy and Climate Change Consultant	United Kingdom (of Great Britain and Northern Ireland)
17125	10	13	10	13	I would like to know the reason why you can say "this might change in coming years". It is helpful if you add the evidence of this prediction.	If, available, further information will be added.	KEIICHI IGARASHI	Mitsubishi UFJ Research and Consulting Co., Ltd.	Japan
42431	10	13	10	22	Line 22-233 should be moved up alongwith line 13.	Editorial. Copyedit to be completed prior publication.	Bhaskar Sinha	Indian Institute of Forest Management	India
1401	10	15	10	16	not only oil palm, but also fast growing timber species for pulp and paper. See e.g. Abood et al 2014 cited on p61 of this chapter "rapid expansion of timber plantations in Indonesia is the largest driver of the loss of higher carbon native forests'	Accepted, reference will be added.	Jonah Busch	Earth Innovation Institute	United States of America
8551	10	15	10	16	Major drivers of deforestation in Indonesia : subsistence agriculture, oil palm expansion, plantation forest and mining (see: Wijaya et al. 2016. ASSESSMENT OF LARGE SCALE LAND COVER CHANGE CLASSIFICATIONS AND DRIVERS OF DEFORESTATION IN INDONESIA. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.972.708&rep=rep1&type=pdf)	Accepted, reference will be added.	Diah Auliyani	Watershed Management Technology Centre	Indonesia
9667	10	15	10	16	A proper reference here say that about 28% of all deforestation in SE-Asia is conversion to tree crops, mostly oil palm): V De Sy, M Herold, F Achard, V Avitabile, A Baccini, S Carter, et al., 2019. Tropical deforestation drivers and associated carbon emission factors derived from remote sensing data. Environmental Research Letters	Thank you for the references. They will be added to the text.	Martin Herold	Wageningen University	Netherlands
17127	10	15	10	16	In the sentence "widspread deforestation was linked to oil palm plantation", the past form (was) is applied. Does it mean that deforestation caused by oil palm plantation doesn't happen in recent years?? If so, please add the evidence. (My take on this matter is that oil plam plantation still causes a lot of forest transition in Indonesia and Malaysia	Verb tense will be corrected.	KEIICHI IGARASHI	Mitsubishi UFJ Research and Consulting Co., Ltd.	Japan
17921	10	15	10	16	True about palm oil, but it is also very land efficient so replacement with other oils could increase deforestation. Perhaps specify this	Noted. Literature on that will be checked.	Luke Spajic	University of Adelaide (graduate student researcher), University of Oxford (visiting student researcher)	Australia
26847	10	15	10	16	Rubber, cashews, sugar cane are also an important expanding crops in the region and in countries that are not investing heavily in oil palm. See Zeigler (2009) Science; Fox (2012) Envirnmental Science, Hurni et al (2017) Remote Sensing; Dove (2018) Nature Plants, etc.	Accepted, references will be added.	Louis Verchot	International Center for Tropical Agriculture	Colombia
38619	10	15	10	16	Sometimes oil palm is classified as forest land based on countries land definition. Thus, it might be better to say "deforestation of primary forest" or something like that here.	Noted, thank you.	Atsushi Sato	Mitsubishi UFJ Research and Consulting Co.,Ltd.	Japan
38621	10	15	10	16	It seems better using "oil palm" or "palm oil" consistently in this chapter. In the other part (eg, line 48 in same page saying palm oil.	Editorial. Copyedit to be completed prior publication.	Atsushi Sato	Mitsubishi UFJ Research and Consulting Co.,Ltd.	Japan
6785	10	15	10	17	I believe a citiation Is needed.	Editorial. Copyedit to be completed prior publication.	Valasia Iakovoglou	International Hellenic University	Greece
28963	10	15	10	21	I suggest to make this paragraph is to talk about deforestation in south-east asia. In SEA, the deforestation are varied. As you mention in Malaysia and Indonesia, there are palm oil plantation expansion. But, in case of Indonesia, the government also already make moratorium for palm oil plantation so it is getting slower. In those two countries, there are also a rapid land use change for industry and settlement. You also can add more about the SEA. I believe, in Mekong area, the deforestation is rapid because they tried to build giga-projects for hydropowers. Anyway, kindly add more reference about this part	Accepted, the text will be revised and new references will be added.	Marissa Malahayati	National Institute for Environmental Studies	Japan

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
46175	10	15	10	23	While the first seven lines are extracted from Imai et al., (2008) for Southeast Asia, only two lines are left for the rest of the tropics, without references.	Accepted, the text will be revised and new references will be added.	Daniel Ortiz-Gonzalo	Department of Geosciences and Natural Resource Management, Faculty of Science, University of Copenhagen	Denmark
10415	10	15	10	33	Only one reference for two whole paragraphs?	Accepted, the text will be revised and new references will be added.	Andy Reisinger	NZAGRC	New Zealand
9775	10	19	10	19	Misspelling Viet Nam - Vietnam	Editorial. Copyedit to be completed prior publication.	Jeanne Bormann	Ministry of agriculture	Luxembourg
16859	10	21	10	21	Extra spaces after line. Pls move next line up.	Editorial. Copyedit to be completed prior publication.	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
22147	10	21	10	23	Spacing (Line 21) and the word 'row". Should it "grow"?	Editorial. Copyedit to be completed prior publication.	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
28965	10	22	10	23	Please add more explanation for central and south america and sub-saharan africa.	Editorial. Copyedit to be completed prior publication.	Marissa Malahayati	National Institute for Environmental Studies	Japan
1403	10	25	10	33	this paragraph needs a citation	Accepted, the text will be revised and new references will be added.	Jonah Busch	Earth Innovation Institute	United States of America
19197	10	25	10	33	Please provide references	Accepted, the text will be revised and new references will be added.	Cheah Singfoong	Independent consultant, formerly more than 10 years with the National Renewable Energy Laboratory, USA	United States of America
39769	10	28	10	28	delete 'of'	Editorial. Copyedit to be completed prior publication.	David Manning	Newcastle University	United Kingdom (of Great Britain and Northern Ireland)
47569	10	28	10	29	If it refers to "plantations" that word should be used. Plantations shoudl be clearly differentiated from "planted forest", as the latter does not immply the former, despite political efforts by several sources to conflate the two.	Noted, clarification will be added.	Zoltán Rakonczay	European Commission, Directorate General for Research	Belgium
27281	10	35	10	35	Terms like forest degradation need a definition, with a link to the glossary. See and refer to chapter4 of SRCCL	Noted, definition will be added.	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
9669	10	35	10	37	The proper reference for this statement should be: N Hosonuma, M Herold, V De Sy, et al., ... 2012. An assessment of deforestation and forest degradation drivers in developing countries. Environmental Research Letters 7 (4), 044009	Editorial. Copyedit to be completed prior publication.	Martin Herold	Wageningen University	Netherlands
19199	10	35	10	42	This paragraph implies that forest degradation in Africa is not significant. There are other literatue that somewhat support or not support this conclusion. E.g., see Brandt et al., 2018, Nature Ecology & Evolution, Vol 2, p827-835 and McNicol et al., 2018, Nature Communications, Vol 9, article 3045	Accepted, the text will be revised and new references will be added.	Cheah Singfoong	Independent consultant, formerly more than 10 years with the National Renewable Energy Laboratory, USA	United States of America
33125	10	35	10	42	In addition to fuelwood and charcoal, another major cause of forest degradation though poorly reported is livestock overgrazing grazing sometimes through shamba systems.	Noted, if available, references will be included.	George Gatere Ndiritu	University	Kenya
46227	10	35	10	42	Regional patterns of changes in forest cover. The discussion on degradation is too narrow as it fails to acknowledge that differences in forest condition (referred to above) affect average carbon stocks, biodiversity values and relative integrity and stability, i.e. between primary (or old growth) forests, production forests still largely reliant on natural regeneration and planation forests. This oversight means decision makers fail to see the opportunity cost associated with (a) the ongoing loss of primary forests and (b) the sequestration benefits of allowing previously logged natural forests to recover their biological potential including their natural carbon carrying capacity (Mackey et al . 2020 (see above)). Evidence from Australia (Lindenmayer and Sato 2018) suggests that fire internsity and severity is exacerbated by commercial logging of natural forests resulting in ecosystem collapse in the Central Highlands of Victoria. Analaysis of the 2019/20 fire pattern and intensity in Australia expected to be published this year confirms the importance of understanding forest condition and encouraging action to protect and restore forest ecosystem integrity.	Accepted, the text will be revised and new references will be added.	Virginia Young	Australian Rainforest Conservation Society, Griffith University, CAN Ecosystems	Australia
24	10	37	10	42	Which 'last figure' are the authors refering to?	Editorial. Copyedit to be completed prior publication.	Stella Kabiri-Marial	National Agricultural Research Organisation	Uganda

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
9777	10	39	10	39	How does charcoal production link up with the benefits stated in other chapters?	Noted, mention to charcoal in other chapters will be checked.	Jeanne Bormann	Ministry of agriculture	Luxembourg
47571	10	39	10	40	It is unclear what the "sustainable manner" implies and how it is estimated	Text will be revised to make it clearer.	Zoltán Rakonczay	European Commission, Directorate General for Research	Belgium
9779	10	44	10	53	It would be nice to show a graph with soybean fluxes (in terms of import/export origins) across the world and to distinguish between the different uses (food, feed, other inputs for the industry).	Thank you for the suggestion. We will evaluate if it is possible to include such figure.	Jeanne Bormann	Ministry of agriculture	Luxembourg
32117	10	44	10	53	In this section on “Trade and commodities export”, we are lacking information from Africa… for example the cocoa exported from the continent, etc.…	Accepted, the text will be revised and new references will be added.	Denis Jean Sonwa	CIFOR (Center for International Forestry Reseacrh)	Cameroon
1611	10	45	10	45	This should read 'Latin America' not 'Latin American'.	Editorial. Copyedit to be completed prior publication.	Jenkins Rhosanna	University of East Anglia	United Kingdom (of Great Britain and Northern Ireland)
16615	10	45	10	45	I believe this embodied land-use change is misleading as say in Brazil and places corn has replaced soybeans, soybeans move north displacing beef and beef moved north into the rain forest area. Thus taking the commodity that's immediately exported off the land ignores the chain of causality. I'm not sure in embodied land-use change argument is a very good one	Noted, this will be taken into consideration.	Bruce McCarl	Texas A & M University	United States of America
16861	10	45	10	45	Too long sentence, pls split into two.	Editorial. Copyedit to be completed prior publication.	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
27283	10	45	10	45	The concept of embodied land use needs introduction. More literature is available related to this issue, see e.g. other comments above, 10.1016/j.gfs.2016.08.001, 10.1038/s41559-019-0824-3, 10.1093/biosci/biu225, but also information on uncertainty 10.1016/j.ecolecon.2013.12.003. And, the focus on area is one, there are extension, e.g. biodiversity, NPP, etc. 10.1016/j.gloenvcha.2016.03.013, 10.1016/j.scitotenv.2017.02.078, 10.1111/jiec.12715	Noted, this will be taken into consideration.	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
22271	10	45	10	46	What about coffee?	Noted, this will be taken into consideration.	Noureddine Benkeblia	The University of the West Indies	Jamaica
1405	10	45	10	49	again see Pendrill et al 2019 for a more up-to-date and comprehensive reference	Thank you for the suggested reference.	Jonah Busch	Earth Innovation Institute	United States of America
22149	10	46	10	46	The word 'bloc"	Editorial. Copyedit to be completed prior publication.	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
40377	10	46	10	46	recommendation is to use the classification of geographical regions rather than historical (too sensitive to some of readers). Replace the former Soviet bloc to… (which region meant here?)	Noted, this will be taken into consideration.	Gunta Kalvane	University of Latvia	Latvia
2903	10	51	10	53	Brazil is the world's largest producer of sugarcane and has the highest export volume of sugar of any country, at 19.6 million metric tons as of 2018/2019. At current stage sugarcane is the main source of renewable energy in Brazil (Department of Soil and Crop Sciences and Natural Resource Ecology Laboratory, Colorado State University). For example, the expansion of sugarcane production in the central-southern region of Brazil is due to the increase in the domestic fleet of flex fuel vehicles and export demand for bioethanol. So along with soybean, expansion of sugarcane cultivated area should be mentioned as well (Neto et al. 2016, doi: 10.1111/gcbb.12251).	Noted, this will be taken into consideration.	Yurii Pyrozhenko	IPCC TFI TSU	Japan
12781	10	44	11	10	Regarding the agriculture-related drivers of deforestation, Leblois et al., 2017, shows that agricultural exports value has a statistically significant role in low income countries using recent remotely sensed data, showing that trade and agricultural commodities exports may have an impact on deforestation: https://www.sciencedirect.com/science/article/pii/S0305750X16305411	Thank you for the suggested reference.	antoine leblois	INRA	France
16565	10	45			I believe this embodied land-use change is misleading as say in Brazil and places corn has replaced soybeans, soybeans move north displacing beef and beef moved north into the rain forest area. Thus taking the commodity that's immediately exported off the land ignores the chain of causality. I'm not sure in embodied land-use change argument is a very good one	Noted, this will be taken into consideration.	Bruce McCarl	Texas A & M University	United States of America
12669	10	2			Drivers of forest loss varied regionally (Curtis et al. 2018). Unsustainable forestry and wildfire were the	Editorial. Copyedit to be completed prior publication.	Eray Özdemir	General directorate of Forestry	Turkey
22593	10	2			I would say forest management instead. Forestry is the study of trees, etc.	Editorial. Copyedit to be completed prior publication.	Melissa Lucash	Portland State University	United States of America
16495	10	6			Under REDD+, (attention to plus), forest management should be mentioned and highlighted and past activities should be evaluated. Also other climate zones rather than tropical and sub-tropical should be added	Evaluation of REDD+ will be presented in the subsection on Policies	Mostafa Jafari	Head of TPS for LFCCs/ and IPCC LA	Iran
21617	10	7			(De Sy, 2010)	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
22595	10	8			Add "is", as in "and is the most…"	Editorial. Copyedit to be completed prior publication.	Melissa Lucash	Portland State University	United States of America
22597	10	10			I would add globally to this sentence to drive home the point. Or “at a global scale”.	Editorial. Copyedit to be completed prior publication.	Melissa Lucash	Portland State University	United States of America

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
1399	10	11			in Latin America, by far the dominant manifestation of "commerical agriculture" as a driver of deforestation is cattle pasture.	Accepted, cattle raising will be included.	Jonah Busch	Earth Innovation Institute	United States of America
17769	10	13		13	"... But this might change in the coming years", please be more specific, in what sense.	Accepted, the text will be revised.	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
17771	10	15		16	Does not look compatible witn the reduced rates of deforestation in Indonesia. Please clarify.	Noted, the text will be revised.	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
21619	10	15		16	deforestation vs oilpalm plantation?pls mention the literautre	Noted, the text will be revised.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
22599	10	15			I think you need a topic sentence here. Perhaps: “There are regional differences in the reasons for deforestation.”	Editorial. Copyedit to be completed prior publication.	Melissa Lucash	Portland State University	United States of America
21621	10	18		19	(such as:…Philippines,…..)are….	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21623	10	20			(Such as:…Cambodia,…..)are….	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
22601	10	21			Omit “prevalence” and change to “because of their high rates of deforestation”.	Editorial. Copyedit to be completed prior publication.	Melissa Lucash	Portland State University	United States of America
22603	10	27			I’m not sure why you discuss the spatial pattern of trees here (e.g. planting rows). It’s an aesthetic problem, not a C mitigation issue unless the plantings are poorly spaced. It doesn’t feel relevant	Editorial. Copyedit to be completed prior publication.	Melissa Lucash	Portland State University	United States of America
21625	10	32			do you mean Kalimantan Island or Borneo Island?	Borneo Island.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
22605	10	35			I think one degradation is enough in the sentence and the remaining two could be omitted.	Editorial. Copyedit to be completed prior publication.	Melissa Lucash	Portland State University	United States of America
43207	10	35			depending on the time frame, one could say that all timber extraction degrades forest--not just the illegal kind. Maybe be impolitic to say that here, but it is a fact that carbon is removed for a period of time and the forest will be in a degraded state during that time.	Noted, the concept of forest degradation will be better explained.	Deborah Lawrence	University of Virginia	United States of America
22607	10	40			Where does the 26% come from? Citation? If it’s Masera, I’d move it up.	Editorial. Copyedit to be completed prior publication.	Melissa Lucash	Portland State University	United States of America
14761	10	45			American should be replaced by America	Editorial. Copyedit to be completed prior publication.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
43209	10	45			…embodied land use change INSERT emissions' as below in line 47	Editorial. Copyedit to be completed prior publication.	Deborah Lawrence	University of Virginia	United States of America
43211	10	50			why 'macro economic' rather than simply 'economic'	Editorial. Copyedit to be completed prior publication.	Deborah Lawrence	University of Virginia	United States of America
44159	11	0	11	0	Please provide clear "export names at the top of the figure".	Noted, figure will be revised.	Tshepiso Mafole	University of Cape Town	South Africa
19799	11	1	11	18	Fig 7.5 should better be placed before paragraph from lines 1-10 since this paragraph does not refer to fig 7.5, In fig 7.5 color for ROW cannot be found, what is PNG ?	Noted, figure and text will be revised.	Michael Englisch	Austrian Research Centre for Forests	Austria
2905	11	2	11	5	It might be relevant to add the following text: "In terms of land-use change to sugar cane, more than 95% of expansion has been from pasture (~70%), grain crops (~25%) and citrus (~1%)". (Mello et al. 2014, https://doi.org/10.1038/nclimate2239).	Accepted and thank you for the suggested reference.	Yurii Pyrozhenko	IPCC TFI TSU	Japan
26	11	6	11	6	remove 's' from certifications to certification programs	Editorial. Copyedit to be completed prior publication.	Stella Kabiri-Marial	National Agricultural Research Organisation	Uganda
47573	11	6	11	6	The attribution to certification programmes seems unsubstantiated.	Accepted, references will be added.	Zoltán Rakonczay	European Commission, Directorate General for Research	Belgium
10417	11	6	11	10	Please provide examples of where and how local conditions matter, otherwise the statement is close to self-evident.	Accepted, the text will be revised to include some examples.	Andy Reisinger	NZAGRC	New Zealand
26849	11	6	11	10	This is unclear. How do the outcomes vary? What is considered a positive outcome or a negative one? What leads to positive outcomes?	Accepted, the text will be revised to include some examples.	Louis Verchot	International Center for Tropical Agriculture	Colombia
4927	11	11	11	13	The figure is really hard to read. The colors are not distinctive enough. Also there is not clear pattern in the cumulative stacking of the individual shares: is it always alphabetical? It is not by volume - which it should be - always leaving RoW on the top.	Noted, figure will be revised.	Patrick Lamers	National Renewable Energy Laboratory	United States of America
28	11	11	11	17	Fig 7.5 is unclear, Specifically the soybean and palm oil figures. A profile graph for this kind of data was not the most appropriate choice. I suggest either bar graphs or time series line graphs. If the authors want to maintain this format clarity can be improved by the use contrasting colours for each country.	Noted, figure will be revised.	Stella Kabiri-Marial	National Agricultural Research Organisation	Uganda
953	11	11	11	17	Fig 7.5 is unclear, Specifically the soybean and palm oil figures. A profile graph for this kind of data was not the most appropriate choice. I suggest either bar graphs or time series line graphs. If the authors want to maintain this format of the graph, it's better to use contrasting colours for each country.	Noted, figure will be revised.	Stella Kabiri-Marial	National Agricultural Research Organisation	Uganda

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
18137	11	11	11	17	If the caption is correct, this graph shows own calculations of the authors, which does not seem compatible with the rules for an assessment (which should evaluate the state of knowledge based on an assessment of the pertinent literature). It may be okay to present graphs if they merely visualize data the authors have assessed as being reliable that are taken from a quoted source; even then it is extremely important to be completely transparent in terms of data source and calculations that have been involved in generating the visualization	Noted, complete reference of the figure will be provided.	Helmut Haberl	Institute of Social Ecology, University of Natural Resources and Life Sciences, Vienna	Austria
11271	11	11	11	18	Why only four Primary exports are addressed, where are the other, are these the only four that has majot impact in relation to Climate Change??? Why only four, please give justification	These are relevant examples. Considering the space limitations, it will not be possible to cover a large number of exports in the figure.	Mahmood Riyaz	Maldivian Coral Reef Society	Maldives
28967	11	11	11	18	What is the correlation between Figure 7.5 with the other passage on this sub-section?	Noted, text will be revised to make the connection with the figure.	Marissa Malahayati	National Institute for Environmental Studies	Japan
46177	11	11	11	18	Nice figure. Why is it plotting only the period for 2000-2011? I think FAOSTAT has data until 2018 on these commodities	Thank you, we will evaluate the inclusion of more years.	Daniel Ortiz-Gonzalo	Department of Geosciences and Natural Resource Management, Faculty of Science, University of Copenhagen	Denmark
16863	11	13	11	13	This figure/graph was confusing for me. For example, in the 'beef' subgraph, I see a line going from near '4' (vertical axis) on the left to around 9% (vertical axis) on the right. I am not sure what that line signifies. Also, this line partitions the area of Argentina, and I am not sure what that means. This comment applies to all such solid lines in the other three subgraphs. Also, what does 'ROW' and 'PNG' mean? ALso, some colours are too similar (eg, Bolivia and Argentina in 'Soybeans').	Noted, figure will be revised.	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
10537	11	13	11	17	Abbreviations (ROW, PNG) should be spelled out. ROW and PNG are not shown in the figure.	Noted, figure will be revised.	Hiroko Akiyama	National Agriculture and Food Research Organization	Japan
38911	11	13	11	17	The data used in the graphs are taken from the FAOSTAT Trade Crop and LIvestock domain (http://www.fao.org/faostat/en/#data/TP), and this is how the data source should be quoted. This is because FAOSTAST (http://www.fao.org/faostat) is a collection of dozens of often independent datasets spanning many dimensions of food and agriculture. Also, what kind of ''own caculations'' were performed? All of the data shown is availabe in FAOSTAT as is	Thank you. The reference will be corrected. The figure is from the Henders et al. 2015 paper and details about the calculations will be included.	francesco tubiello	FAO	Italy
38913	11	13	11	17	THIS IS VERY IMPORTANT FOR FAO and in general to ensure that other people's data are treated with the upmost scientific rigour. Have the authors of this chapter consulted with the original FAOSTAT data owners on the nature and limitations of the original data, prior to engage in ''own calculations''? I would advise that you do.	Thank you. The reference will be corrected. The figure is from the Henders et al. 2015 paper and details about the calculations will be included.	francesco tubiello	FAO	Italy
38915	11	20	11	20	Again: the authors appear to mix land cover and land use definitions, unnecessarily. Mangroves ''deforestation'' by IPCC definitions is a subset of deforestation, hence it only covers anthropogenic land use change. Natural changes also described in the text are not deforestation. Either change the title or add specific qualifiers in the text to clarify this issue	Noted; addressed	francesco tubiello	FAO	Italy
28969	11	20	11	21	I started to "lost" here. So, you already mention the drivers of land use change in the beginning. That part already including the mangrove land? Or only mineral land? Or what? If you want to make a special section for mangrove deforestation, kindly explain why this part is important? what is the "different" with the previous sub-section?	Noted; addressed	Marissa Malahayati	National Institute for Environmental Studies	Japan
12173	11	20	11	39	very good with a separate paragraph on mangroves - please keep.	Noted; thank you	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
16865	11	20	11	39	The english in this para has to be polished up a bit; right now, the meaning implied in several sentences is unclear. Here are some suggestions: 'Most biodiverse mangrove forests are located in South Asia' > 'Mangrove forests that have maximum levels of biodiversity are located in South Asia'. 'Globally declination in mangrove distribution is attributed primarily to' > 'Globally, the decline in mangrove forest distribution can be attributed primarity to'. 'Urbanisation, industrialisation and increasing demand for commodities for population increase play crucial role for the loss of mangroves in form of mangrove deforestation' > 'Urbanisation, industrialisation and the increased demand for commodities for a growing population all play crucial roles for the loss of mangrove forests'. Other sentences have to be suitably modified.	Noted; addressed.	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
22273	11	20	11	39	Pollution was also reported to impact negatively the mangrove in many tropical countries.	Noted; agreed; pollution has been mentioned already; addressed	Noureddine Benkeblia	The University of the West Indies	Jamaica
27597	11	20	11	39	Please mention the consequences that higher, multimeter sea-level rise would have for mangroves, I assume it would be very destructive	Noted; addressed	Dorota Retelska	Independent	Switzerland
32119	11	20	11	39	In this section on “Major drivers of mangroves deforestation”, we are lacking information from Africa continent. Please check with some references such as this one (“The Land/Ocean Interactions in the Coastal Zone of West and Central Africa” https://link.springer.com/book/10.1007/978-3-319-06388-1) if we can have more information from the continent to support this section. Probably that beyond information more specific on carbon stocks (“Assessment of Mangrove Carbon Stocks in Cameroon, Gabon, the Republic of Congo (RoC) and the Democratic Republic of Congo (DRC) Including their Potential for Reducing Emissions from Deforestation and Forest Degradation (REDD+)” https://link.springer.com/chapter/10.1007/978-3-319-06388-1_15) we can have details on the divers of mangroves degradation & deforestation	Noted; addressed	Denis Jean Sonwa	CIFOR (Center for International Forestry Reseacrh)	Cameroon
2939	11	20	11	40	Pakistan/Karachi mangroves is very important to national and internation environment and it is missing the link in the "Major drivers of mangroves deforestation"	noted; addressed	Adnan Arshad	China Agricultural University	China

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
11593	11	21	11	22	Could be changed to - "The biodiverse mangrove forests of South Asia, Southeast Asia and Asia-Pacific contain ~46% of the world's mangrove ecosystems	Noted; addressed	John Devaey	Trinity College Dublin	Ireland
24481	11	21	11	39	Win. S, Towprayoon. S, and Chidthaisong. A (2019) reported about mangrove species extent and declination in Ayeyarwaddy Delta Coastal Zone of Myanmar due to community livelihoods needs on specific species in terms of anthropogenic action and salinity difference and natural disaster e.g Cyclone Nargis in early May 2008.	Noted; addressed	SAN WIN	Environmental Conservation Department, Ministry of Natural Resources and Environmental Conservation	Myanmar
11595	11	24	11	24	Replace Globally declination with "Global decline"	Noted; addressed	John Devaey	Trinity College Dublin	Ireland
39773	11	24	11	24	is declination the right word? It has a very specific meaning when discussing magnetic fields.	Noted; addressed	David Manning	Newcastle University	United Kingdom (of Great Britain and Northern Ireland)
43223	11	25	11	27	word choice--not necessary to have both drivers and activities; delete 'in the form of…'	Noted; addressed	Deborah Lawrence	University of Virginia	United States of America
12217	11	28	11	33	Nutrient is probably not an appropriate term used here i.e. linking to salt water.	Noted; addressed	Mohammad Ibrahim Khalil	University College Dublin	Ireland
38623	11	31	11	31	If there is no specific reason excluding Typhoon from tropical storms, suggest saying "tropical storms (hurricanes, cyclones, typhoon)" here.	Noted; addressed	Atsushi Sato	Mitsubishi UFJ Research and Consulting Co.,Ltd.	Japan
5069	11	33	11	33	Assessment of climate change on spatial pattern of mangrove ecosystem in Iran …could be cited in the text as a reference (recommended) https://doi.org/10.1007/s00704-015-1552-5	Noted; addressed	Sayed Masoud Mostafavi Darani	Iran Meteorological Organization	Iran
16849	11	33	11	35	The term 'land cover changes' is confusing. Maybe this is better? 'Primary drivers include conversion of land to different land covers and associated land use practices'. Of course, land cover means something different than land use, and it may be best to define it (both terms?) before use.	Noted; addressed	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
30595	11	35	11	35	This is the one allusion to aquaculture being a driver of mangrove deforestation but it would be more useful if the specific species grown in mangrove-deforested aquaculture operations are highlighted to inform consumer and policy dietary changes.	Noted; addressed	Raychel Santo	Johns Hopkins Center for a Livable Future, Bloomberg School of Public Health	United States of America
6265	11	38	11	39	Together with increased reforestation programs, sustainable mangrove management for mangrove conservations I suggest to include livelihood diversification and policy aspect which are important for sustainability especially in developing countries.	Noted; addressed	Brown Gwambene	Marian University College	United Republic of Tanzania
10419	11	38	11	39	I struggle to read this statement as anything other than a tautology (sustainable mangrove management is essential for mangrove conservation - how could it not be?)	Noted; addressed	Andy Reisinger	NZAGRC	New Zealand
37037	11	38	11	39	The senetence as is now sounds prescriptive. However, the following reference clearly shows through rigorous empirical study how much protection can be provided by Mangrove in case of cyclone/supercyclones and need for pro actove mangrove management. Das, S. (2011). Can Mangroves Minimize Property Loss during Big Storms?: An Analysis of House Damages due to the Super Cyclone in Orissa. In A. Haque, M. Murty, & P. Shyamsundar (Authors), Environmental Valuation in South Asia (pp. 170-210). Cambridge: Cambridge University Press. doi:10.1017/CBO9780511843938.009	Noted; addressed	Joyashree Roy	Asian Institute of Technology, Thailand. Jadavpur University, India	Thailand
43233	11	38	11	39	delete	Noted; addressed	Deborah Lawrence	University of Virginia	United States of America
39771	11		11		Figure 7.5: plese clarify the explanation of the figure. What is the line in each case? For the avoidance of doubt, define ROW.	Noted, figure will be revised.	David Manning	Newcastle University	United Kingdom (of Great Britain and Northern Ireland)
17257	11	41	12	18	Fire (prevention) management is also important in this regard. Regionally, fire prevention led to the accumulation of large fuel loads that enabled "catastrophic" fires.	Accepted, text will be revised to include this information.	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany
44161	11	41	12	18	You have mentioned the extent and causes of wildfires in the tropical regions, but what about the temperate regions where grasses are generally successful but still contribute largely to ecosytem services. You can look at this paper for more information, https://doi.org/10.1088/1748-9326/ab541e	Thank you for the reference. We will consider its inclusion in the text.	Tshepiso Mafole	University of Cape Town	South Africa
14765	11	41	12	19	No mention of Figure 7.6 in the text.	Accepted, this will be corrected.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
22609	11	1			From the figure it looks like palm oil more than doubled- maybe 2.6X?	Noted, thank you.	Melissa Lucash	Portland State University	United States of America
43213	11	1			doubling since 2001 sounds like a lot, but most likely it was very small in 2001 so for context should include actual totals/numbers.	Accepted, information will be provided in the text.	Deborah Lawrence	University of Virginia	United States of America
21627	11	3			Aide, 2017	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21629	11	5			(e.g.forest). The….	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21631	11	5			onto or on to	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
22611	11	5			Replace , with a period.	Editorial. Copyedit to be completed prior publication.	Melissa Lucash	Portland State University	United States of America
35123	11	5			(e.g. forests). Instead of (e.g. forests),	Editorial. Copyedit to be completed prior publication.	Happiness Nnko	The University of Dodoma	United Republic of Tanzania
14763	11	6			certifications shoild be replaced by certification	Editorial. Copyedit to be completed prior publication.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
3351	11	10			one reference is missing	Editorial. Copyedit to be completed prior publication.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
21633	11	13		18	source under the figure	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
43215	11	13			why were these focal countries picked? For wood products ROW (rest of world?) is huge--likely includes other big players. Especially important if some of those players are developed nations. That way it is not just less developed countries being called out.	Noted, the figure will be revised.	Deborah Lawrence	University of Virginia	United States of America
46865	11	13			Please use more distinct colours; difficult to seperate country data	Noted, the figure will be revised.	Martin Schönhart	University of Natural Resources and Life Sciences, Vienna	Austria
43217	11	20			no s on mangroves in this header	Noted; addressed	Deborah Lawrence	University of Virginia	United States of America
43219	11	21			need to make the case for why you are focusing on these particular forests--is it their carbon density? Not clear.	Noted; addressed	Deborah Lawrence	University of Virginia	United States of America
22613	11	22			Connect these two ideas with a semicolon. As in "Asia-Pacific; they contain	Noted; addressed	Melissa Lucash	Portland State University	United States of America
6787	11	23			"Miettinen et al. 2019) . The highest", please correct the extra space after the parenthesis.	Noted; addressed	Valasia Iakovoglou	International Hellenic University	Greece
22615	11	24			Simplify to: Globally, the delineation of mangrove distribution is attributed primarily to anthropogenic activities…"	Noted; addressed	Melissa Lucash	Portland State University	United States of America
43221	11	24			decline is the proper form, not declination.	Noted; addressed	Deborah Lawrence	University of Virginia	United States of America
22617	11	27			They "play a crucial role in the loss…". The part that says "in the form…" is redundant and could be omitted.	Noted; addressed	Melissa Lucash	Portland State University	United States of America
43225	11	29			salt is not the same kind of factor as a nutrient; take it out of the parenthesis and make it its own thing	Noted; addressed	Deborah Lawrence	University of Virginia	United States of America
22619	11	31			. Add "also" earlier. As in … outbreak have also been found…"	Noted; addressed	Melissa Lucash	Portland State University	United States of America
43227	11	31			tsunamis? Strange thing to include here. what is the connection?	Noted; addressed	Deborah Lawrence	University of Virginia	United States of America
43229	11	32			adversely impact mangroves (delete 'loss')	Noted; addressed	Deborah Lawrence	University of Virginia	United States of America
43231	11	34			just 'cover'; delete 'changes'	Noted; addressed	Deborah Lawrence	University of Virginia	United States of America
10421	11	41			It seems odd to have a climate impact/adaptation issue thrown in amongst socio-economic drivers - I feel it would be better to have socio-economic drivers grouped together, and then have a section that looks at climate impacts and other pressures (this should include food price spikes that are in part caused by climate extremes alongside markets)	Accepted, the section will be reorganized.	Andy Reisinger	NZAGRC	New Zealand
43235	11	41			I'm realizing that I can't see the organizational flow in this chapter. Wildfires are next, following mangroves. What is the logic? Could you order the drivers by magnitude? Or some kind of categorization? There is no logic here.	Accepted, the section will be reorganized.	Deborah Lawrence	University of Virginia	United States of America
22275	12	1	12	2	Wildfires have been worsen by climate change, affecting larger areas and are more frequent. This statement is contradictory to what is reported in L 14-18 of the same page.	Rejected, the statements are not contradictory.	Noureddine Benkeblia	The University of the West Indies	Jamaica
38815	12	1	12	2	If wildfires are the largest contributor, what are other contributors? Also, what is the percent contribution of wildfires to global biomass burning? What is the differentiation between human-ignited wildfires, and wildfires potentially started due to anthropogenic influence on underlying factors. It seems difficult to parse those out here without a definition of wildfires.	Accepted, the definition of wildfires will be included.	Julian Reyes	Personal Capacity	United States of America
38917	12	1	12	2	Same comment as above. ''Biomass burning'' is the actual IPCC category for which emissions/removals are to be reported in NGHGI and in any accounting of AFOLU, whereas wildfires are a larger category that also includes natural fires --which do not necessariy contribute to AFOLU --unless you use the land use proxy to account (and then--this should be discussed much earlier in the chapter, at its outset)	Accepted, the text will be revised to improve clarity.	francesco tubiello	FAO	Italy
576	12	1	12	12	I do not believe that the term "wildfire" covers fires lit by humans for land clearing. The term "wildfire" should be used only for fires that are of natural origin, or of accidental origin but burn uncontrolled. See for example the comprehensive definition in "https://en.wikipedia.org/wiki/Wildfire".	Accepted, the definition of wildfires will be included.	Pierre Bernier	Natural Resources Canada	Canada

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
6789	12	1	12	12	I would suggest connecting all those sentensses into one paragraph, so it has the form of a complete paragraph.	Editorial. Copyedit to be completed prior publication.	Valasia Iakovoglou	International Hellenic University	Greece
27285	12	1	12	18	A quantification of human-indued fires can be found here: 16/j.ecolecon.2009.07.003	Thank you for the reference, it will be included.	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
26851	12	1	12	19	This section needs a lot more work. The SRCCL had a good discussion of fires, the human and climate drivers of fires and the consequences. This section should identify what else needs to be said and focus on that. Looking at fire emissions of CO2 and SLCFs might be a good approach.	Thank you, previous report will be considered.	Louis Verchot	International Center for Tropical Agriculture	Colombia
16617	12	4	12	4	In this section on wildfires it might be good to say something about peat fires and unmanaged land fire such as those occurring in Alaska.	Accepted, the text will be revised.	Bruce McCarl	Texas A & M University	United States of America
25867	12	4	12	6	It may be important to be clear with concepts and definitions of forests that are being used throughout the manuscript. Some authors consider that commercial plantations should not be considered forests as they do not provide all the ecosystemic services and do not have all the ecological characteristics of native forests. The distinction should be clear enough to avoid the use of the concept of forests inadequately as pretext to use commercial plantations as the main mechanism for carbon capture. This is currently the case of Chile, where commercial plantations are being used as one of the main NDC policies. Commercial plantations have been directly associated with an increase in wildfires frequency and magnitude, thus the distinction is important. I suggest using the terms commercial plantations and native forests to make a difference.	Noted, definitions will be added.	Jorge Hoyos-Santillan	University of Magallanes	Chile
43241	12	8	12	10	are these types of fires wild? Could you define--call them 'escaped' from managed burns? So many fires in the tropics are set on purpose you can't call them wild at all.	Noted, definitions will be added.	Deborah Lawrence	University of Virginia	United States of America
19691	12	9	12	10	for example, for industrial oil-palm and paper-pulp plantations in Indonesia (Chisholm et al. 2016), and for pastures in the Amazon (refs.)	Noted, references will be added.	Mochamad Indrawan	Research Center for Climate Change - Universitas Indonesia (RCCC-UI)	Indonesia
19693	12	9	12	10	ref: Gustavo Oliveira & Susanna Hecht (2016) Sacred groves, sacrifice zones and soy production: globalization, intensification and neo-nature in South America, The Journal of Peasant Studies, 43:2, 251-285, DOI: 10.1080/03066150.2016.1146705	Thank you for the reference. It will be checked.	Mochamad Indrawan	Research Center for Climate Change - Universitas Indonesia (RCCC-UI)	Indonesia
1615	12	10	12	10	There are no references to support the example of 'pastures in the Amazon'. These should be added in.	Accepted, references will be added.	Jenkins Rhosanna	University of East Anglia	United Kingdom (of Great Britain and Northern Ireland)
28971	12	10	12	10	Yes, don't forget to put the reference on "refs"	Editorial. Copyedit to be completed prior publication.	Marissa Malahayati	National Institute for Environmental Studies	Japan
39257	12	10	12	10	I think you could considerate adding this reference: Luiz E. O. C. Aragão, Liana O. Anderson, Liana O. Anderson, Marisa Gesteira Fonseca, Marisa Gesteira Fonseca, Sassan Saatchi. 21st Century drought-related fires counteract the decline of Amazon deforestation carbon emissions. February 2018Nature Communications 9(1):536. DOI: 10.1038/s41467-017-02771-y	Editorial. Copyedit to be completed prior publication.	Roberta Zecchini Cantinho	UNDP / UnB	Brazil
39775	12	10	12	10	replace 'refs' with cited references	Editorial. Copyedit to be completed prior publication.	David Manning	Newcastle University	United Kingdom (of Great Britain and Northern Ireland)
41759	12	10	12	10	refs: Barlow et al., 2012. Biological Conservation, 154, 1-8. doi.org/10.1016/j.biocon.2012.03.034 Barlow et al., 2019. Global Change Biology, 119-141. doi.org/10.1111/gcb.14872	Thank you for the additional references.	Cecile Girardin	University of Oxford	United Kingdom (of Great Britain and Northern Ireland)
25757	12	10	12	12	Suggest expansion on drivers of wildfire: natural fire occurrence vs fire in managed areas.	Accepted, distinctions will be made.	Helen Hughes	University of Edinburgh	United Kingdom (of Great Britain and Northern Ireland)
43243	12	11	12	12	doesn't make grammatical sense to me	Editorial. Copyedit to be completed prior publication.	Deborah Lawrence	University of Virginia	United States of America
33069	12	12	12	12	reference writing style needs to be checked (Nunes et al. 2016, Mancini et al, 2018)	Editorial. Copyedit to be completed prior publication.	Mirzokhid Mirshadiev	Wageningen University and Research	Netherlands
39777	12	14	12	14	delete 'are'	Editorial. Copyedit to be completed prior publication.	David Manning	Newcastle University	United Kingdom (of Great Britain and Northern Ireland)
578	12	14	12	18	Please see text in chap 2 of SRCCL on the global decrease in area burnt by wildfires	Thank you, previous reports will be considered.	Pierre Bernier	Natural Resources Canada	Canada
38951	12	14	12	18	More data are needed in my view to support that wildfire regimes are changing.	Noted, additional references will be added.	Vassilis Litskas	Cyprus University of Technology; Open University of Cyprus	Cyprus

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
39779	12	16	12	16	delete 'are'	Editorial. Copyedit to be completed prior publication.	David Manning	Newcastle University	United Kingdom (of Great Britain and Northern Ireland)
46179	12	19	12	19	Figure 7.6 is not mentioned in the text. Do the zoom in Portugal (a) make a point in this section? e.g. number of fires (higher in the north of Portugal) versus fire average size (higher in the centre). These are mainly plantations of eucalyptus sp. What about the square in Southeast Africa and Madagascar?	Noted, figure will be mentioned in the text with additional information.	Daniel Ortiz-Gonzalo	Department of Geosciences and Natural Resource Management, Faculty of Science, University of Copenhagen	Denmark
28973	12	19	12	21	1. what is the meaning of "a" and "b"? It is for the two panels? Or the two small boxes over there?	a and b are the two panels as explained in the figure legend. Figure will be revised.	Marissa Malahayati	National Institute for Environmental Studies	Japan
28975	12	19	12	21	2. It is only for africa and europe? If you want to talk about forest fire, it is 'incomplete" without talk about amazonia and Indonesia.	The authors will be asked if they can provide a better figure.	Marissa Malahayati	National Institute for Environmental Studies	Japan
28977	12	19	12	21	3. What is the relation between this figure with the passage before it?	Noted, figure will be mentioned in the text with additional information.	Marissa Malahayati	National Institute for Environmental Studies	Japan
27135	12	19	12	22	Figure 7.6 : Fire number (7.6.a) and average sizes (7.6.b) are given per region, which is not informative and even misleading, as region size is not defined (and probably differs between regions). These data should be given per unit area.	The authors will be asked if they can provide a better figure, but regional impacts are also related to the region size.	Marc Aubinet	University of Liege	Belgium
43245	12	20	12	21	don't you want a figure for change rather than the actual number? How can we tell if this is worsening? Change over time in number or change in size of fire area would be more informative. We can't tell what the trend is from this figure alone	The authors will be asked if they can provide a better figure.	Deborah Lawrence	University of Virginia	United States of America
17259	12	20	12	22	Please revise figure: does (a), (b) refer to the panels or to the separate cutouts in each panel?	a and b are the two panels as explained in the figure legend.	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany
16867	12	21	12	21	This figure is pixelated in many parts. Also, the legend text (eg, 'Number of fires per region') is very hard to make out. Applies to both the figs. Also, this figure is not referred to, in the text	The authors will be asked if they can provide a better figure.	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
27287	12	25	12	27	Abandonment is not a driver, but a consequence of drivers. It is maybe an archetype of change or a syndrom (10.1007/s10113-015-0907-x, 10.1016/j.gloenvcha.2018.08.006). The underlying drivers are important to present here, that include transport technologies that allow for better allocation, enhanced yields in agriculture that allow for the abandonent of marginal land, etc, see 10.1007/s10113-007-0024-6, 10.1111/j.1530-9290.2008.00076.x. The Sovjet collaps is a case on its own leading to abandonment, e.g. 10.1088/1748-9326/ab1cf1	Accepted and thank you for the references. The text will be revised	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
16875	12	26	12	26	Should be "(semi) natural"	Editorial. Copyedit to be completed prior publication.	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
6795	12	26	12	27	Are the citations place in chronological or alphabetical order, ex (Song et al 2018, Fuchs et al. 2012, Chen et al. 2019). Please be consistent throughout the chapter.	Editorial. Copyedit to be completed prior publication.	Valasia Iakovoglou	International Hellenic University	Greece
35129	12	26	12	27	(Song et al. 27 2018), instead of (Song et al 2018)	Editorial. Copyedit to be completed prior publication.	Happiness Nnko	The University of Dodoma	United Republic of Tanzania
27289	12	28	12	28	The term "sustainable" needs explanation and legitimation here. In its current form, the text suggests that forestry is sustainable in any instance, including the terms of climate change. But the issue is complex. Forestry reduces carbon stocks, forestry in a condition of regrowth slows down regrowth and creates a climate opportunity costs. There is a huge body of literature on this, and it needs to be presented and assessed according to the ipcc assessment style (maybe not at this position in the text). In its current formulation it is misleading. Carbon impacts and sustainable forestry (harvest < increment) are two different, independent issues (see also, e.g. 10.1038/nclimate2695)	Accepted and thank you for the references. The text will be revised	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
12141	12	29	12	30	Please explain the abbreviation NEP.	Editorial. Copyedit to be completed prior publication.	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
46229	12	25	13	14	Forest management Drivers in temperate and boreal zones. Comments about the relationship between logging and fire intensity/severity above are relevant to this section.	Noted, it will be considered in the revision.	Virginia Young	Australian Rainforest Conservation Society, Griffith University, CAN Ecosystems	Australia
27291	12	29	13	2	Contrasting harvest pressure with NEP is difficult to understand without further introduction. It could be contrasted with figures on harvest to increment. The values for the individual regions should be given as well, not only the global average (as many large forests are indeed only used at low values, but forests in Eastern US and Europe show very high harvest rates, up to or even exceeding 100% (sources, e.g. https://www.eea.europa.eu/data-and-maps/indicators/forest-growing-stock-increment-and-fellings-3/assessment).	Noted, it will be considered in the revision.	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
16567	12	4	#REF!	####	In this section on wildfires it might be good to say something about peat fires and unmanaged land fire such as those occurring in Alaska.	Accepted, the text will be revised.	Bruce McCarl	Texas A & M University	United States of America
21635	12	1		2	where this study was conducted?	It is a global study.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21637	12	1		12	sould be 1 paragraph	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
43237	12	1			add actual numbers to support the idea that it is the 'largest contributor'	Accepted.	Deborah Lawrence	University of Virginia	United States of America

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
22621	12	6			I don't think this relevant to your topic at hand. Consider omitting it.	Noted, it will be considered in the revision.	Melissa Lucash	Portland State University	United States of America
43239	12	6			word missing? '…among others'. 'other WHATs?' effects? Impacts?	Editorial. Copyedit to be completed prior publication.	Deborah Lawrence	University of Virginia	United States of America
21639	12	8		9	. For example,	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
22623	12	8			Change to "Wildfires have many different causes, but the primary driver in tropical regions is land clearing for agriculture."	Editorial. Copyedit to be completed prior publication.	Melissa Lucash	Portland State University	United States of America
17773	12	10		10	missing references, to be provided	Editorial. Copyedit to be completed prior publication.	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
6791	12	10			in the Amazon (refs.). Please add citation.	Editorial. Copyedit to be completed prior publication.	Valasia Iakovoglou	International Hellenic University	Greece
21641	12	10			(refs.)???	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
29929	12	10			Please add specific refereces.	Editorial. Copyedit to be completed prior publication.	RAEHYUN KIM	Institute	Republic of Korea
35125	12	10			(refs.) spell out the reference	Editorial. Copyedit to be completed prior publication.	Happiness Nnko	The University of Dodoma	United Republic of Tanzania
6793	12	12			You need to be consistent and separate the citations in the same manner, ex (Nunes et al. 2016, Mancini et al, 2018) or (Nunes et al. 2016; Mancini et al, 2018). Please check throughout the chapter.	Editorial. Copyedit to be completed prior publication.	Valasia Iakovoglou	International Hellenic University	Greece
21643	12	12			between literatuture use (;)	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
35127	12	12			Mancini et al. 2018 instead of Mancini et al, 2018	Editorial. Copyedit to be completed prior publication.	Happiness Nnko	The University of Dodoma	United Republic of Tanzania
14769	12	14			wildfire seasons are (delete are)	Editorial. Copyedit to be completed prior publication.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
14771	12	16			are occuring should be replaced by occurance	Editorial. Copyedit to be completed prior publication.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
22625	12	16			Add ref along with Artes. Jolly, W. M. et al. Climate-induced variations in global wildfire danger from 1979 to 2013. Nat. Commun. 6, 7537, https://doi.org/10.1038/ncomms8537 (2015).	Thank you for the reference.	Melissa Lucash	Portland State University	United States of America
22627	12	17			It's more about the fuels than the water content of the trees. I would say leading to drier fuels are leading to high severity wildfires" with no dash before severity. Also, higher temps cause more lightening and it's not always about leading to a stressed state. Here are one of the refs on CC and ligening: https://science.sciencemag.org/content/346/6211/851	Thank you for the reference.	Melissa Lucash	Portland State University	United States of America
21645	12	21		22	same with pg. 6 line 38	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
22629	12	21			A world map of different disturbances would be more beneficial than one just focused on wildfire, esp since some fires cause LUC and some do not.	Thank you for the suggestion but a global map on disturbance will be difficult to organize considering the scope of the chapter.	Melissa Lucash	Portland State University	United States of America
43247	12	24			title implies that forest management happens only in the temperate/boreal. Not the case. If you changed title to 'FM drives emissions in the boreal…' it would not limit the effect of FM to the boreal/temperate while calling attention to it as an important driver there (as well as in the tropics)	Accepted.	Deborah Lawrence	University of Virginia	United States of America
22631	12	25			The main driver of land change in some boreal regions is wildfire, not forest management. Like AK. There is very little forest management in Alaska.	Accepted, the text will be revised.	Melissa Lucash	Portland State University	United States of America
21647	12	26			space between (semi) natural	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21649	12	26			et al. and between literauture add (;)	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
14767	12				Does the number of fires per region surface includes both wild fire and human induced (the fire per surface region shown in India -Punjab region are human induced)	The authors will be asked if they can provide a better figure.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
44163	13	0	13	0	This figure can be improved to a consistent use of font size of the axis and readability of the figure legends or table (this is unclear).	The authors will be asked if they can provide a better figure.	Tshepiso Mafole	University of Cape Town	South Africa
16877	13	3	13	3	should be "the 2009 econmic recession"	Editorial. Copyedit to be completed prior publication.	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
47575	13	6	13	7	Is there any evidence of the implied increased planting?	Accepted, references will be added.	Zoltán Rakonczay	European Commission, Directorate General for Research	Belgium

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
580	13	11	13	14	I do not think that the MPB outbreak has ever been described as part of a trend in increasing natural disturbances in Canada's boreal forests, unlike the unmentioned trend in area burned (an exception to the global trend of decreases in area burned by wildfires). In addition, the sentence is unclear a to what the "strong driver" refers to. Natural disturbances, especially extensive forest fires but also extensive insect outbreaks, are main drivers of natural forest dynamics in Canada's boreal forests, and tree species are adapted to them. For more on climate change and the circumboreal forest, please refer to Gauthier et al, 2015 (doi:10.1126/science.aaa9092.).	Accepted, the text will be revised.	Pierre Bernier	Natural Resources Canada	Canada
19801	13	11	13	14	As to these disturbances and their connection to climate change compare SEIDL, R., SCHELHAAS, M.-J. and LEXER, M.J. (2011), Unraveling the drivers of intensifying forest disturbance regimes in Europe. Global Change Biology, 17: 2842-2852. doi:10.1111/j.1365-2486.2011.02452.x, being partly caused by stand age, increase of conifers. Austrlia: see below: where ?; wouldn't give Australia as example for temperate and boreal zones	Thank you for the references.	Michael Englisch	Austrian Research Centre for Forests	Austria
27293	13	11	13	14	Drough-induced calamities could be mentioned here, case of e.g. Austria, induced by cc and affecting mostly monocultures	Noted, it will be considered in the revision.	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
16879	13	14	13	14	Pls add the sentence: "Windstorm related damages could also have a significant impact on the European forest carbon budget (citation: Seidl, R., Schelhaas, M. J., Rammer, W., & Verkerk, P. J. (2014). Increasing forest disturbances in Europe and their impact on carbon storage. Nature climate change, 4(9), 806-810.)"	Accepted and thank you for the reference.	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
28979	13	16	13	30	"Supply and Consumption trends in agriculture" I confuse with this part because I don't understand why this part should be here? It is the driver of land use change? Or the driver of mangrove change? Or both? Or just another additional section? This is why I mention you that I started to lost from this driver section. Kindly make a clear formatting, so the reader can understand the relation between each sub-section and stuff.	Accepted. The structure and format of the section will be revised.	Marissa Malahayati	National Institute for Environmental Studies	Japan
32865	13	18	13	22	Perhaps should change the section title to emphasize this section referring mainly to "area of land use" (the second sentence in this paragraph emphasizes that there is no change in land area devoted to agriculture since 1990 but then later on p17 (first two paragraphs) the emphasis switched to how much the "purpose/activity" of the land use had changed.	Noted. The authors thank the reviewer for their suggested title. The structure of the section will be revised and it is hoped that the discussion on land use will be clearer	Cheah Singfoong	Independent consultant, formerly more than 10 years with the National Renewable Energy Laboratory, USA	United States of America
11273	13	18	13	30	What is developing Pacific??? What is the status of other regions eg Europe??? Asutralia??	Noted & accepted. Asia and developing pacific is an official term according to the IPCC 5 region classification. Discussion on other regions will be included.	Mahmood Riyaz	Maldivian Coral Reef Society	Maldives
46501	13	18	13	30	What is the GHG contribution from the increased use of synthetic fertilizer?	Noted. Emissions from increased fertilizer should be provided in Section 7.2 (Trends) but will also mentioned here	Rachel Bezner Kerr	Cornell University	United States of America
18141	13	18	13	34	This section is purely descriptive and fails to explain in what sense the depicted changes in fertilizer use represent a driver (of what) respectively are driven (by what?). This is not to say changes in fertilizer use were irrelevant, on the contrary, but it is not clear why this material is part of this section	Accepted. More discussion on the implications of increased fertilizer will be presented, with reference to the associated increased emissions, and should have linkage to Section 7.2 (Trends).	Helmut Haberl	Institute of Social Ecology, University of Natural Resources and Life Sciences, Vienna	Austria
6801	13	19	13	19	Please add citation.	Accepted. Proper citation will be included	Valasia Iakovoglou	International Hellenic University	Greece
16869	13	19	13	19	I suggest to re-write this sentence as: "In 2017, the global agricultural land agricultural land area (croplands, permanent meadows and pastures) was around 4,813 Mha, an increase of 4% (198 Mha) since the 1970s; increases in the area of croplands was primarily responsible." Land-use categories in capitals (eg, Croplands, Meadows) are not necessary	Accepted. This sentence will be re-written as part of wider planned changes to the entire subsection	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
38819	13	19	13	22	Are these two sentences/facts connected? Are these facts saying most of the increase (4% since 1970s) occurred between 1970 and 1990? Does the second sentence about agricultural activities include grazing? In other words, does the term “agricultural activities” encompass more than the activities defined in agricultural land (croplands plus permanent meadows and pastures)? Some clarification is needed between actual land cover and land use/activities	Noted. The author accept that this sentence is ambiguous. The sentence will be revised, most likely as part of wider revisions.	Julian Reyes	Personal Capacity	United States of America
20007	13	19	13	30	"(Croplands plus Permanent Meadows and Pastures)" and elsewhere in the paragrpah: use lower case cor land categories	Noted. The use of capital letters will be revised as part of planned wider changes to the section.	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
39781	13	19	13	34	you simply give figures for N, which is appropriate given N's dominant impact in terms of embedded carbon cost and also emissions of non-carbon greenhouse gases. But it would be useful to give the same figures for K and P, both of which have grown similarly, and both of which offer scope for mitigation through imrpoved management. Figure 7.7 should clearly state that this relates only to N (if that is indeed the case)	Accepted. However, P & K contribute minorly to GHG emissions and emphasis is therefore on N. Nonetheless, discussion will be provided on P and K emissions. The figure caption will be changed.	David Manning	Newcastle University	United Kingdom (of Great Britain and Northern Ireland)
20009	13	20	13	21	"an increase in the Croplandsarea has been primarilly responsible for this increase": suggest "mostly due to cropland expansion"	Accepted. This sentence will be changed.	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
20011	13	21	13	22	"However, at the global scale there has been almost no change in the area of land devoted to agricultural activities since 1990.": suggest "Most of this increase happened before 1990, with almost no net change at the global level in the past three decades"	Accepted. The authors thank the reviewer for their suggestion. The sentence will be changed accordingly	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
20013	13	22	13	24	"Major recent regional trends are an increase in cropland and a decrease in Forest land in Africa and Middle East and Latin America and Caribbean": suggest "Recent regional trends show an increase in cropland and decrease in forest land in Africa, the Middle East, Latin America and the Caribbean"	Noted. The sentence will be changed as part of planned wider revisions to the subsection.	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
37039	13	24	13	26	Increase in Nitrogen fertiliser use in India and drivers of that change especially link to fertiliser price policy is clearly shown the following literature. So how market based policy can increase efficiency in N use is also mentioned. Also shows how methane from paddy cultivation declining in India due to change in practices . Might be relevant for section 7.7 also. Some, S., Roy, J., & Ghose, A. (2019). Non-CO2 emission from cropland based agricultural activities in Indi : A decomposition analysis and policy link. Journal of Cleaner Production, 225, 637–646. https://doi.org/10.1016/j.jclepro.2019.04.017	Noted. The authors thank the reviewer for their suggestions. However, with consideration it is felt that specific reference to policy in India is inappropriate without reference to potential drivers in other countries.	Joyashree Roy	Asian Institute of Technology, Thailand. Jadavpur University, India	Thailand
38953	13	24	13	26	A reference should be placed here, about the N use. I suppose it is FAOSTAT	Accepted. A reference will be provided.	Vassilis Litskas	Cyprus University of Technology; Open University of Cyprus	Cyprus
5071	13	25	13	25	fertlizer use has increased……has been increased	Noted. The sentence will be changed.	Sayed Masoud Mostafavi Darani	Iran Meteorological Organization	Iran
20015	13	25	13	25	" Mtyr-1": space before yr	Noted. The unit will been changed as part of planned wider revisions.	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
20021	13	26	13	27	"When adjusted for land area, the annual quantity of N applied per ha": don't need "when adjusted for land area" as the rest of the sentence indicates it is adjuste for land area	Accepted. Reference to the adjustment of land will be removed.	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
20023	13	28	13	29	"highest in Asian and Developing Pacific": here it should be mentioned that the area releated N use is a more useful metric than total N use, but even more useful is if N use is related to procudtion, particularly in Asia, where at many lcoations the very high annual N application rate corresponds with relatively high annual yields from double and triple cropping	Accepted. This is an interesting point. The sentence will be changed accordingly, with discussion on yield not included.	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
20025	13	28	13	29	"Asian and Developing Pacific": should be "Asia and Developing Pacific"	Accepted. 'Asian' will be changed.	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
16881	13	29	13	29	"with decade on decade increases" should be "with rapid increases"	Noted. The authors thank the reviewer for their suggestion. An alternative term will be used.	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
20019	13	30	13	30	"Developed Countries and Eastern Europe": comma instead of "and"	Accepted. The sentence will be changed following planned wider revision of the subsection.	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
28981	13	31	13	34	The figure is super small, I think you can remove the the table as long as you can make the diagram easy to read and understand :) thank you :)	Noted. The figure will be changed and the table removed	Marissa Malahayati	National Institute for Environmental Studies	Japan
29159	13	31	13	34	Difficult to read the figure	Noted & accepted. The figure will be changed.	SMAIL KHENNAS	Energy and Climate Change Consultant	United Kingdom (of Great Britain and Northern Ireland)
1465	13	32	13	34	The resolution of Fig. 7.7 is too low. The words and numbers are not clear, expecially the sub-figure.	Noted & accepted. The figure will be revised.	JUNGUO LIU	Southern University of Science and Technology	China
16883	13	33	13	33	Fig 7.7, Right vertical axis should be "Synthetic nitrogen (N) fertilizer (million tons)"	Noted. The figure will be revised.	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
38919	13	33	13	34	Have the authors contacted the reelvant staff at FAO to make sure a) they are using the most available recent data; b) they are well aware of the characteiristics, definitions and limitations, including uncertainties, of the dat being shown? It is suggested that the authors contact teh relevant FAO staff in charge of the specific domains . Additionally, please use the actual web address of teh specific dataset taht is being analyzed, specifying its name (for instance: FAOSTA Land Use dataset), rather using ''FAOSTAT'' as a generic catch all, with the generic address. Better information on where to get the source data will be more useful for the interested reader. In the case of FAOSTAT land use, the authors may wish to consult FAO's own analytical brief describing th emost recent data: http://www.fao.org/economic/ess/environment/data/land-use/en/	(a.) Noted. Contact has been made with relevant FAO staff. (b.) Noted. It is hoped that following coordination with relevant FAO staff, proper reference will made to the limitations and uncertainties of the data. (c.) Accepted. Proper reference will provided to the FAO source.	francesco tubiello	FAO	Italy
282	13	37	13	38	It will be good indicate how much had changed from 1970 and until when? Also indicate the data source of this sentence	Accepted. This sentence will be changed and a reference will be provided.	Rodrigo Rudge Ramos Ribeiro	Getulio Vargas Foundation	Botswana
12067	13	31	14	14	Figur 7.7 and 7.8 are difficult to read. Small numbers and too much text	Accepted. Both 7.7. and 7.8. will be changed and will hopefully be more legible.	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
17775	13	31	14	24	Figures 7.7, 7.8, 7.9 good but almost unreadable.	Accepted. The figures will be changed.	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
17411	13		14		Figure numbers are not legible	Noted & accepted. The figures will be changed.	Zeyaeyan Sadegh	Islamic Republic of Iran Meteorological Organization (IRIMO)	Iran
27295	13	18	19	9	This is quite redundant with SRCCL and not adding much, should be revised along the scoping of the chapter (regional focus, stonger link to cc, etc.)	Noted. Revisions will emphasise developments since SRCCL and also regionality	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
21653	13	1		14	1 paragraph	Noted. The structure of this paragraph will be reviewed.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
6797	13	2			Please correct the grammar "Most recent drivers are increases in demand".	Accepted. The grammar will be revised.	Valasia Iakovoglou	International Hellenic University	Greece
43249	13	3			what is 'bioeconomy' (I see it is explained a bit more further on, but defining it here, the first time you use it, would be helpful.	Accepted. Following wider revision of the entire subsection, definition of the term 'bioeconomy' will be provided when the term is first used.	Deborah Lawrence	University of Virginia	United States of America
21651	13	6			and Gras, 2013; abt, 2015	Noted. The punctuation will be revised.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
22633	13	8			You can omit the “too” and just say a strong bio-economy may…. “. A reference is needed here.	Accepted, editorial comment	Melissa Lucash	Portland State University	United States of America
22635	13	11		14	But these cause pulses in forest mortality, not LUC.	Noted, the sentence will be revised.	Melissa Lucash	Portland State University	United States of America
6799	13	11			" the apparent increases in natural " cange to " the apparent increase in natural "	Accepted, editorial comment	Valasia Iakovoglou	International Hellenic University	Greece
43251	13	11			also in many parts of the US	Noted. Consideration will be given to the US.	Deborah Lawrence	University of Virginia	United States of America
38817	13	12			What about the bark beetle in western North America (i.e., including the Intermountain West of the United States)?	Noted. The authors thank the reviewer for their suggested inclusion.	Julian Reyes	Personal Capacity	United States of America
35131	13	13			13 (Hlasny et al. 2018) instead of (Hlasny et al, 2018)	Accepted. Punctuation will be revised.	Happiness Nnko	The University of Dodoma	United Republic of Tanzania
46867	13	13			I think it is worthwhile to mention the link to climate change, i.e. heat and drought stress in recent years in combination with poorly adapted spruce monocultures.	Noted. The authors thank the reviewer for their suggestion. This will be considered.	Martin Schönhart	University of Natural Resources and Life Sciences, Vienna	Austria
29535	13	14			Bartalev, 2015; Add this article to the refernce	Accepted. This reference will be added to the list of references.	RAEHYUN KIM	Institute	Republic of Korea
29931	13	14			Please add specific refereces.	Noted. References will be added.	RAEHYUN KIM	Institute	Republic of Korea
10425	13	16			The following sections are all heavily biased towards supply-side trends - it would be very helpful to have a more balanced assessment that includes demand-side trends and their drivers (even the section on page 15 mostly focuses on supply side technology and intensification, despite its title referring to demand). Also there seems to be an almost exclusive focus on livestock in the figures - please include some key crops as this is about food production and demand, not (yet) about emissions.	Accepted. Greater emphasis will be placed on demand side aspects. Figures on crop production are to be included.	Andy Reisinger	NZAGRC	New Zealand
21655	13	19			In 2017,	Accepted. The sentence will be changed in accordance with wider planned changes to the subsection.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
43253	13	23			hard to understand how major regional trends have not included deforestation and ag expansion in SEAsia and Amazonia. What time period is meant by 'recent'? Does it somehow exclude the period since 1970s when we lost so much of the rainforest as first timber then subsistence and then industrial agriculture followed?	Noted. 'Recent' will be properly defined and figures will be checked and better explained.	Deborah Lawrence	University of Virginia	United States of America
43255	13	29			I realize the numbers don't lie, so maybe the context needs spelling out: I was surprised that the highest fertilizer per area numbers did not come from the US corn belt (or some place were US over-fertilizes). I would urge explicit mention of the developed world numbers; this is a big part of nonCO2 forcing.	Accepted. Regional breakdown of fertilizer use will be provided where data allows.	Deborah Lawrence	University of Virginia	United States of America
21657	13	33		34	sources? Withoud fullstop at the end	Noted. The figure caption will been revised.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
43257	13	37			statement that total land in agriculture has not changed since the 70s is hard to reconcile with the fact that major land use change occurred in the tropics since the 70s. Do you mean that it was balanced by extratropical forest regrowth, so no net change? please address this explicitly, preferably at the beginning of this paragraph. we have had steady deforestation to open up land for agriculture. you need to explain why (if) this does not lead to more ag land.	Noted. Further explanation regarding agricultural land area will be provided.	Deborah Lawrence	University of Virginia	United States of America
38821	14	1	14	2	Is there a reason that cattle and buffaloes are lumped in one category? Can you discuss how individually (cattle or buffaloes) have changed since 1970?	Accepted. Differentiation between cattle and buffalo will be made.	Julian Reyes	Personal Capacity	United States of America
6803	14	1	14	3	Please add citation.	Accepted. A reference will be provided	Valasia Iakovoglou	International Hellenic University	Greece
17261	14	3	14	8	Please check and correct: in the last part of the sentence, you give twi values and name four regions - how do they relate to each other?	Accepted. Reference to specific regions will be clarified according the IPCC region classification	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany
28983	14	9	14	10	Figure 7.8 also too small. Maybe it is your style to overlap two diagram together, will be good idea for presentation but for report paper, it is hard to read :)	Accepted. The figure will be amended.	Marissa Malahayati	National Institute for Environmental Studies	Japan
38921	14	10	14	23	Same comment for the use of FAOSTAT livestock and meat data as made above for the use within AR6 of FAOSTAT land use data. In brief, please consult with the original data owners before finallizing the graphs or the FAO data analysis.	Accepted. Relevant FAO staff have be contacted and their advice will be gratefully received in due course.	francesco tubiello	FAO	Italy
16885	14	11	14	11	Fig 7.8: Do we need the actual numbers as text below the table? They are quite distracting and take up quite a lot of space. This applies to fig 7.9 & 7.10 too.	Accepted. Tables will be removed from the figures.	Ranjith Gopalakrishnan	University of Eastern Finland	Finland

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
33071	14	11	14	12	Figure footnotes should be written in the same format.	Noted. It is hoped that planned changes to the figure caption will satisfy the reviewers comment.	Mirzokhid Mirshadiev	Wageningen University and Research	Netherlands
35133	14	11	14	12	re-align for consistency	Noted. It is hoped that planned revision of the figure caption will satisfy the reviewers comments	Happiness Nnko	The University of Dodoma	United Republic of Tanzania
2933	14	12	14	22	The line in the text about forest destruction need to be revised with the available numbers or statistices from WWF and FAO in Pakistan and Srilanka	Noted. Unfortunately, it is unclear what this comment refers to.	Adnan Arshad	China Agricultural University	China
16623	14	14	14	14	Climate change has caused shifts of land from cropping to pasture as well as reductions in livestock stocking rates. For some evidence see Land use and management change under climate change adaptation and mitigation strategies: a U.S. case study Jianhong E. Mu, A. Wein, Bruce A. McCarl, Mitigation and Adaptation… 2013	Noted. Discussion on changes in stocking rates will be included.	Bruce McCarl	Texas A & M University	United States of America
16887	14	14	14	14	performance' > 'yeild'	Accepted. The term 'performance' will be changed to 'yield'.	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
28985	14	14	14	15	"these changed livestock population and increases in individual animal performance have resulted in an increased supply of fresh milk and meat." This phrase is super confusing. Let's make it to the point, maybe "The supply of fresh milk and milk in increase in line with the increase of livestock population and its better performance." Anyway, please re-read everything again because you will find out lots of passage like this that need to be edited.	Noted. Planned revision of the entire subsection should clarifying statements, including the statement referred to by the reviewer.	Marissa Malahayati	National Institute for Environmental Studies	Japan
46181	14	19	14	22	Figure 7.9 Data sourced from FAOSTAT (2013)? Cannot be 2013 when data goes up to 2017	Noted. Proper citation will be provided.	Daniel Ortiz-Gonzalo	Department of Geosciences and Natural Resource Management, Faculty of Science, University of Copenhagen	Denmark
28987	14	19	14	23	Figure 7.9. Too small. And did the unit is Million tonnes? If so, I think it is better to write is Mton not Million t.	Accepted. The figure will be changed and the axis title amended.	Marissa Malahayati	National Institute for Environmental Studies	Japan
33075	14	22	14	23	Figure 7. 8 Global trends from 1970 to 2017 for number of livestock (million heads) and poultry 12 (billion heads). Data sourced from. Add information source : FAOSTAT	Accepted. Proper reference to the source will be provided.	Mirzokhid Mirshadiev	Wageningen University and Research	Netherlands
33077	14	22	14	23	7. 9 Global trends of (a) meat and (b) milk produced. Data sourced from FAOSTAT. Add: year (2013)	Accepted. Proper reference to the source will be provided.	Mirzokhid Mirshadiev	Wageningen University and Research	Netherlands
35135	14	23	14	24	re-align for consistency	Accepted. The figure caption will be realigned.	Happiness Nnko	The University of Dodoma	United Republic of Tanzania
20027	14	25	14	27	"The production of livestock products has increased at a faster rate than that of population": repetition from the paragrpah before	Accepted. It is planned to rewrite the entire subsection with the aim of avoiding repetition.	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
29163	14	27	14	27	More recent figure than 2013 if available	Accepted. The data and associated discussion will be updated.	SMAIL KHENNAS	Energy and Climate Change Consultant	United Kingdom (of Great Britain and Northern Ireland)
29161	14		14		Difficult to read the figure	Accepted. The figure will be amended and will hopefully improve legibility.	SMAIL KHENNAS	Energy and Climate Change Consultant	United Kingdom (of Great Britain and Northern Ireland)
11275	14	25	15	4	Why there s no increase in milk consumption in East Europe and west and Central Aisia? Is it iclimate change related?? And what is the reason for remaining milk and meat consumption in Developed countries static?? What me be possible factor that have influenced, any relation to climate ???	Noted. The drivers behind the consumption patterns of milk in East Europe and West-Central Asia will investigated. Associated discussion will be included as appropriate.	Mahmood Riyaz	Maldivian Coral Reef Society	Maldives
20643	14	25	15	4	Presenting results in per capita term is very improtant and it is good that the authors do so. However, by presenting "meat" as a whole, and its historic per capita increase, may lead readers to misleading conclusions about the extent to which it has contributed (and, crucially, will contribute) to land use change. It would be helpful if the "meat" component was broken down between beef, pigs and poultry, where it becomes clearer that most of the increase in per-capita meat supply has come from poultry, not beef (which if i am not mistaken has actually decreased since 1990, globally). This is kind-of visible when comparing Figures 7.8 and 7.10, but it should be explicitly stated.	Accepted. This is an interesting point. Disaggregation of meat consumption by meat will be provided.	Vassilis Daioglou	Copernicus Institute of Sustainable Development	Netherlands
28075	14	10	22	14	Improve the quality of the figures	Accepted. The figures will be amended.	Alix Frank Rodrigue Idohou	National University of Agriculture	Benin
16573	14	14	#REF!	####	Climate change has caused shifts of land from cropping to pasture as well as reductions in livestock stocking rates. For some evidence see Land use and management change under climate change adaptation and mitigation strategies: a U.S. case study Jianhong E. Mu, A. Wein, Bruce A. McCarl, Mitigation and Adaptation… 2013	Noted. This comment will be dealt with under Comment ID. 16623.	Bruce McCarl	Texas A & M University	United States of America
21659	14	11		12	sources? Withoud fullstop at the end	Noted. The figure caption will be revised, including reference to the source.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
43259	14	11			per capita or per area? like 7.10, this gives a strange and rather incomplete view of the topic.	Noted. Figure 7.8 intended to illustrate total global populations and associated trends, therefore per capita or area is not deemed appropriate here.	Deborah Lawrence	University of Virginia	United States of America

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
21661	14	18			(Fig 7.9.	Accepted. The term 'figure' will be amended.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21663	14	20		23	sources? Withoud fullstop at the end	Noted. However, it is unclear what this comment refers to. It is hoped that planned revisions will satisfy the comment.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
16621	15	1	15	1	When you are talking about livestock consumption increases you might at least throw in the word income as the reason that it is increased faster than the rate of population growth has also been an improved standard of living which brings about higher-quality diets	Accepted. Reference and brief discussion on changes in affluence will be included.	Bruce McCarl	Texas A & M University	United States of America
38923	15	5	15	9	Same comments for FAOSTAT food balance sheets data used in AR6 as made above for livestock and land use. Please contact relevant FAO staff fo ruseful insights into the data being used. Or at least let them know that yo uare using them --they could provide more recent data, insights into useability and limititations etc	Noted & accepted. Relevant FAO staff have been contacted and we look forwards to their help in due course.	francesco tubiello	FAO	Italy
31977	15	14	15	16	the statement: 'However, the difference between increase in area and increase in intensity is not always clear, and likewise for decrease in intensity and decrease in agricultural land area.' I am not sure why this is so, an increase in intensity by principle required to keep the same land area.	Noted, the text will be revised to improve clarity.	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
20029	15	17	15	18	"with 76 cases of intensification and 143 cases of disintensification": it is really not clear what these "cases" mean, they can relate to small areas but could equally mean a study which finds that on average in the whole Europe there was intensification or disintensification	Noted, the text will be revised to improve clarity.	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
47577	15	17	15	18	the numbers suggest that 82 cases would both intensify and extensify at the same time. What does that mean?	Noted, the text will be revised to improve clarity.	Zoltán Rakonczay	European Commission, Directorate General for Research	Belgium
20031	15	20	15	21	"Farmers were very important as moderators between underlying drivers and manifestations of agricultural land use change.": this sentence can be deleted, as it doesn't reveal new information	Editorial. Copyedit to be completed prior publication.	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
16625	15	26	15	26	Prices and markets also had role	Noted, it will be considered in the revision.	Bruce McCarl	Texas A & M University	United States of America
31979	15	26	15	26	the statement: 'Technological changes' should read 'Technological changes and scientific advances'	Editorial. Copyedit to be completed prior publication.	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
30597	15	26	15	29	Mention the primary uses of soybeans grown in Brazil (e.g., livestock feed)?	Accepted.	Raychel Santo	Johns Hopkins Center for a Livable Future, Bloomberg School of Public Health	United States of America
46503	15	26	15	33	the reasons for increased soy production go beyond new varieties becoming available. Political-economic and social analysis missing from the discussion, and reliance on one reference for this assessment. Many studies on this subject. See for example Rausch et al. (2019) 'Soy expansion in Brazil's Cerrado', Conservation Letters, (6). doi: 10.1111/conl.12671.	Noted, it will be considered in the revision.	Rachel Bezner Kerr	Cornell University	United States of America
2907	15	32	15	33	"converted in the Brazilian Cerrado" to read as "converted to cropland in the Brazilian Cerrado".	Editorial. Copyedit to be completed prior publication.	Yurii Pyrozhenko	IPCC TFI TSU	Japan
6187	15	35	15	35	…development and change in…	Editorial. Copyedit to be completed prior publication.	Jude Ndzifon Kimengsi	Department of Geography and Environmental Studies, Catholic University of Cameroon (CATUC)	Cameroon
16889	15	35	15	35	This sentence should be: *In Asia, technological development related to agriculture since the 1960s has resulted in significant…"	Editorial. Copyedit to be completed prior publication.	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
20063	15	35	15	35	"development in change in agriculture": delete "in change"	Editorial. Copyedit to be completed prior publication.	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
17923	15	35	15	37	High value products such as?	Noted, it will be considered in the revision.	Luke Spajic	University of Adelaide (graduate student researcher), University of Oxford (visiting student researcher)	Australia
16891	15	36	15	37	traditional crops and the composition of agricultural output of developing Asia has shifted from traditional to high-value products should be "traditional crops; moreover, the composition of agricultural output in this region has shifted from traditional to high-value products"	Editorial. Copyedit to be completed prior publication.	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
27137	15	39	15	39	What is the meaning of GDP? This abbreviation being used only once in the chapter,it would be clearer to give the whole word.	Editorial. Copyedit to be completed prior publication.	Marc Aubinet	University of Liege	Belgium
18145	15	11	16	15	Misses the standards expected for any assessment, in particular for an IPCC report. Even while this is a highly debated issue with thousands of papers published in the last decade and substantial controversy, one is presented with a discussion that would not even be an acceptable for a review paper. Renarrations of various studies arbitrarily taken from large bodies of literature, lacking a clear storyline or underlying concept. Needs complete overhaul	Accepted, the text will be revised.	Helmut Haberl	Institute of Social Ecology, University of Natural Resources and Life Sciences, Vienna	Austria

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
1617	15	15	16	15	The section on changes in agriculture and bioenergy demands does not include any discussion of Africa.	Accepted, the text will be revised.	Jenkins Rhosanna	University of East Anglia	United Kingdom (of Great Britain and Northern Ireland)
27297	15	12	19	12	The structure of the passage is unclear, but most importantly, the text lacks uncertainty language and assessments. See subchapter 7.3 as a template	Accepted, the text will be revised.	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
16571	15	1	#REF!	####	When you are talking about livestock consumption increases you might at least throw in the word income as the reason that it is increased faster than the rate of population growth has also been an improved standard of living which brings about higher-quality diets	Noted. Discussion on changes of income / affluence will be included	Bruce McCarl	Texas A & M University	United States of America
16575	15	26	#REF!	####	Prices and markets also had role	Noted, it will be considered in the revision of the text.	Bruce McCarl	Texas A & M University	United States of America
3353	15	1			milk is not a meat. The sentence could be "... the absolute quantity of milk, and also for meat, consumed per capita, ..."	Editorial. Copyedit to be completed prior publication.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
21665	15	4			Dev Country	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21667	15	7		8	sources? Withoud fullstop at the end	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
46869	15	22			Please consider the role of technological development in increasing supply, decreasing prices and the corresponding need for higher labor productivity, which forces farmers (and marginal land) out of production.	Noted, it will be considered in the revision of the text.	Martin Schönhart	University of Natural Resources and Life Sciences, Vienna	Austria
14773	15	35			technological development in change in agriculture can be written as technological development in agriculture	Editorial. Copyedit to be completed prior publication.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
20033	16	1	16	1	"points out to": delete "out"	Editorial. Copyedit to be completed prior publication.	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
29165	16	1	16	15	For further development you may refer to IPCC special report renewable energy sources and climate change, chap2 bioenergy, 2574 Risks to food security. There are many relevant sections for your chapter in the special eport. However the report was published in 2012. The situation may have changed since	Thank you, previous reports will be considered.	SMAIL KHENNAS	Energy and Climate Change Consultant	United Kingdom (of Great Britain and Northern Ireland)
12175	16	5	16	10	The analysis is interesting but the time period covered (1961-2011) makes the findings less relevant. The time period back to 1960's is too far into the past to base for conclusions about trends in today's land use. Would suggest using studies that use a period starting in 1990-2000 (or threreabout, depending on what is available), going as close to day as possible, as basis for these kind of conclusions. especially important when it comes to bioenergy.	Thank you, the availability of studies covering this timeframe will be checked.	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
14777	16	5	16	15	agricultural biomass (residue) after harvesting economic product is gaining importance for production of fuel from waste biomass	Noted. Other sections and chapters will cover biomass use with more detail.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
28989	16	5	16	15	It is still lack the information about what is the relation between the land use change with the bioenergy supply? What is the challenges for the bioenergy? Please add more explanation about the bioenergy	Noted. Other sections and chapters will cover biomass use with more detail.	Marissa Malahayati	National Institute for Environmental Studies	Japan
2909	16	8	16	9	Example of sugarcane expansion for ethanol production in Brazil can be provided here.	Noted, it will be considered in the revision of the text.	Yurii Pyrozhenko	IPCC TFI TSU	Japan
955	16	9	16	14	Line 9 'Nevertheless, in comparison to dietary shifts in animal products' and line 14 food although the increase in food prices is strongly correlated with carbon prices (Muratori 15 et al 2016).". These statements simply jump into the paragraph, it is not clear what the authors mean or from which context they are mentioned.	Editorial. Copyedit to be completed prior publication.	Stella Kabiri-Marial	National Agricultural Research Organisation	Uganda
1467	16	10	16	10	Asia was emphasized in the last paragraph, since "agriculture is the largest employer in developing countries in Asia". To corresponding with this fact, this paragraph could add some examples in Asia.	Noted, it will be considered in the revision of the text.	JUNGUO LIU	Southern University of Science and Technology	China
16627	16	12	16	12	This section presumes bioenergy responded to economic incentives but also it responded to desires for energy security and climate change mitigation	Noted, it will be considered in the revision of the text.	Bruce McCarl	Texas A & M University	United States of America
11277	16	17	16	17	"Land tenure, land grabbing and green grabbing" How topic is related to climate change? What might be potential climate related factors that influence on this?? And how significance in this for future changes in climate, this relationship has to be established	These topics are related to land use changes and associated emissions.	Mahmood Riyaz	Maldivian Coral Reef Society	Maldives
47579	16	17	16	17	Land tenure is not a driver.	This topic is related to land use changes and associated emissions.	Zoltán Rakonczay	European Commission, Directorate General for Research	Belgium
26853	16	18	16	18	To say that this is a problem in most developing countries is a broad brush generalization that hides a complex reality. It also ignores that this is an issue in emerging economies and many so-called developed countries.	Noted, it will be considered in the revision of the text.	Louis Verchot	International Center for Tropical Agriculture	Colombia

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
46505	16	18	16	49	This assessment of the factors causing land grabs (or foreign land acquisitions) is missing a political economic analysis and some of the key recent papers on this phenomenon. Countries in the Global South, particularly Africa, have been the site of more of these land grabs not primarily due to population growth (which should be a disincentive for land grabs) or simply available land, but also due to issues of unequal power relations between north and south, changing global rules on foreign land acquisitions (which are sometimes required as part of trade agreements or other international agreements), and poor governance in the Global South, in which local land users are not consulted. See some of the following papers for this subject: Edelman M, Oya C, Borras SM. Global Land Grabs: historical processes, theoretical and methodological implications and current trajectories. Third World Quarterly. 2013;34(9):1517-1531. doi:10.1080/01436597.2013.850190; Borras SM, Franco JC, Nam Z. Climate change and land: Insights from Myanmar. World Development. 2020;129 doi:10.1016/j.worlddev.2019.104864. Hunsberger C, Corbera E, Borras SM Jr, Franco JC, Woods K, Work C. Climate Change Mitigation, Land Grabbing and Conflict: Towards a Landscape-Based and Collaborative Action Research Agenda. Canadian Journal of Development Studies. 2017;38(3):305-324.	Accepted and thank you for the references that will be added to the revised text.	Rachel Bezner Kerr	Cornell University	United States of America
6189	16	19	16	23	This is rooted in the diversity of institutions: formal provisions, often being countervailed by informal ones. Also, a gendered perspective on land tenure defines the level of land investments on AFOLU sectors. See also : Nchu, I.N.; Kimengsi, J.N.; Kapp, G. Diagnosing Climate Adaptation Constraints in Rural Subsistence Farming Systems in Cameroon: Gender and Institutional Perspectives. Sustainability 2019, 11, 3767.	Accepted and thank you for the reference that will be added to the revised text.	Jude Ndzifon Kimengsi	Department of Geography and Environmental Studies, Catholic University of Cameroon (CATUC)	Cameroon
25759	16	22	16	22	What does the word 'value' mean here?	Value Management is concerned with improving and sustaining a desirable balance between the wants and needs of stakeholders and the resources needed to satisfy them.	Helen Hughes	University of Edinburgh	United Kingdom (of Great Britain and Northern Ireland)
28289	16	23	16	23	Land tenure often allows communities to exercise traditional governance based on traditional ecological knowledge, devolved and dynamic access rights, judicious use, and equitable distribution of benefits (Mantyka-Pringle et al. 2017, Thomas et al. 2017, Wynberg 2017). This may include biodiversity management through propagation of genetic resources (Contreras-Negrete et al. 2015, Novello et al. 2018) and fire and grazing (Levang et al. 2015, Varghese et al. 2015)	Accepted and thank you for the references that will be added to the revised text.	Mallika Sardeshpande	Rhodes University	South Africa
25761	16	25	16	28	Suggest mention of ecosystem service provision here in relation to value of land.	Noted, it will be considered in the revision of the text.	Helen Hughes	University of Edinburgh	United Kingdom (of Great Britain and Northern Ireland)
16893	16	28	16	28	land system change > "land use change"	Editorial. Copyedit to be completed prior publication.	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
47581	16	36	16	37	Other regions like Russia or Canada have even lower population density, without the same phenomenon.	Noted, other aspects will be included.	Zoltán Rakonczay	European Commission, Directorate General for Research	Belgium
12069	16	36	16	40	The two references are from 2010, is there more up to date literature on land grabbing in Africa?	Accepted, other references will be included.	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
33127	16	36	16	40	Perhap, important to note that leasing of land to muitnational companies could escalate conflicts in already politically unstable regions. Consequently, this will cause more forest loss and degradation.	Noted, this will be considered in the revision of the text.	George Gatere Ndiritu	University	Kenya
39705	16	36	16	44	This section should use more recent data from e.g. https://landmatrix.org/ and respective publications, e.g. Nolte, Kerstin; Chamberlain, Wytske & Giger, Markus (2016) International Land Deals for Agriculture - Fresh insights from the Land Matrix: Analytical Report II. CDE/CIRAD/GIGA/University of Pretoria. Bern, Montpellier, Hamburg, Pretoria http://boris.unibe.ch/85304/1/land_matrix_2016_analytical_report_draft_ii.pdf and refer to the IPCC SECCL with regard to sustainable land use.	Thanks for the references, they will be considered in the revision of the text.	Uwe Fritsche	IINAS	Germany
614	16	42	16	44	The literature on Southeast Asia is largely limited to Cambodian cases. While this is understandable due to the vast scale of land grabbing in Cambodia, additional literature on other countries could also be included:E.g. Myanmar: 1) Borras, S.M., Franco, J.C., Nam, Z., 2020. Climate change and land: Insights from Myanmar. World Dev. 129, 104864. https://doi.org/10.1016/j.worlddev.2019.104864+l16 Generally in SEA: 2) Hall, D., Hirsch, P., Li, T.M., 2011. Powers of exclusion: land dilemmas in Southeast Asia. NUS Press, Singapore	Thanks for the references, they will be considered in the revision of the text.	Arnim Scheidel	Institute of Environmental Science and Technology (ICTA), Autonomous University of Barcelona (UAB)	Spain
6267	16	42	16	44	The paragraph has one sentence only, it is better to either expanding a little bit or merge with the next paragraph.	Accepted, the text will be revised.	Brown Gwambene	Marian University College	United Republic of Tanzania
6807	16	42	16	44	I would suggest composing a prapragraph by using at least three sentenses.	Editorial. Copyedit to be completed prior publication.	Valasia Iakovoglou	International Hellenic University	Greece

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
26855	16	42	16	44	Just saying that the literature on land grabbing has been growing it would be better to summarize the conclusions. Political economy studies help clarify the underlying forces in land grabbing. Conisder the following: Cotula L 2012 The international political economy of the global land rush: a critical appraisal of trends, scale, geography and drivers J. Peasant Stud. 39 649–80. De Schutter O 2011 How not to think of land-grabbing: three critiques of large-scale investments in farmland J. Peasant Stud. 38 249–79 Carter, S., A.M. Manceur, R. Seppelt, K. Hermans-Neumann, M. Herold, L. Verchot. 2017. Large scale land acquisitions and REDD+: a synthesis of conflicts and opportunities. Environ. Res. Lett. 12: 035010.	Thank you, references will be added to the section.	Louis Verchot	International Center for Tropical Agriculture	Colombia
43267	16	42	16	44	say something more or delete	Noted, it will be considered in the revision.	Deborah Lawrence	University of Virginia	United States of America
28991	16	42	16	49	what is "lad grabbing", I don't know it is only me or not who not familiar with this concept, is it "land acquisition" concept? Please explain further	The term land grabbing is widely used in the literature but an explanation will be added	Marissa Malahayati	National Institute for Environmental Studies	Japan
16895	16	46	16	46	"sub-set" > subset	Editorial. Copyedit to be completed prior publication.	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
1619	16	46	16	49	The paragraph is confusing. Suggest rewording to better define green grabbing, or to provide more details of the example given.	Accepted, definition will be added to the text.	Jenkins Rhosanna	University of East Anglia	United Kingdom (of Great Britain and Northern Ireland)
9781	16	46	16	49	The last part of the sentence seems to be incomplete. Shifiting literature references to the end of subphrases would improve lisibility of this sentence.	Editorial. Copyedit to be completed prior publication.	Jeanne Bormann	Ministry of agriculture	Luxembourg
32863	16	46	16	49	If the authors want to cite the Cambodia case as an example, then they should elaborate how this example illusrates how "green factors restrict local users' access. They cannot assume readers will have time or the literature access to read the original article.	Accepted, this will be considered in the revision.	Cheah Singfoong	Independent consultant, formerly more than 10 years with the National Renewable Energy Laboratory, USA	United States of America
28291	16	49	16	49	The Reducing Emissions from Deforestation and Degradation of Forests (REDD+) scheme may at times engender elements of greenwashing, by replacing local governance with more centralised and exclusionary regimes attuned to Western ideals and goals of conservation (Jagger et al. 2012, Krause and Nielsen 2014, Loaiza et al. 2015, Lund et al. 2017)	Thank you for the references. They will be considered in the revision.	Mallika Sardeshpande	Rhodes University	South Africa
16897	16	52	16	52	"land change" > "land use change"	Editorial. Copyedit to be completed prior publication.	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
31981	16	52	16	52	do you mean land use change instead of land change?	Editorial. Copyedit to be completed prior publication.	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
6809	16	52	16	55	I would suggest adding a cititaion	Noted, references will be added.	Valasia Iakovoglou	International Hellenic University	Greece
11279	16	51	17	27	Is there any evidence that migration in the regions are climate related? Relationship between Human population, behavior and migration with climate change has to be clearly established	Here human migration is mentioned as driver of changes in land use.	Mahmood Riyaz	Maldivian Coral Reef Society	Maldives
31983	16	51	17	27	there is no mention of cultural behaviour, this is a barried to change as the culture is intrinsic and will also be a factor in change. Also climate change will influence change as the current land use will be driven by changes in climate - flooded areas will not be suitable for agriculture for example. Some crops won't be sustainable in areas where temperature and rainfall patterns change	Noted, it will be considered in the revision.	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
38955	16	55	17	2	If the prediction for the 2050 is made by Gitay et al. 2007 look if there is a more recent. If not, add a ref for this prediction.	Noted, more recent literature will be checked.	Vassilis Litskas	Cyprus University of Technology; Open University of Cyprus	Cyprus
18147	16	17	18	26	Even while I tend to agree with most that is written here, this text falls short of the standards for an assessment. Land grabbing is a contested concept, and this discussion here lacks a critical assessment of the various positions in that debate, it just assembles a few studies and renarrates them. Again, not clear why particularly the cited studies were drawn from the burgeoning literature on the topic.	Accepted, the text will be revised.	Helmut Haberl	Institute of Social Ecology, University of Natural Resources and Life Sciences, Vienna	Austria
16577	16	12	#REF!	####	This section presumes bioenergy responded to economic incentives but also it responded to desires for energy security and climate change mitigation	Noted, it will be considered in the revision.	Bruce McCarl	Texas A & M University	United States of America
5911	16	5		6	Only one reference quoted on what has been a substantial debate. AR6 is an ASSESSMENT so should be providing greater analysis of the literature, including both sides of an on-going debate such as this.	Accepted, the text will be revised.	Ralph Sims	Massey University	New Zealand
43261	16	5			need to differentiate bioenergy like the kind in subsistence, rural landscapes in E. Africa for instance, from the bioenergy of the kind done in the UK for climate mitigation, and from the kind that would be done for BECCS.	Accepted, but it is important to consider that bioenergy will discussed in other sections and chapters.	Deborah Lawrence	University of Virginia	United States of America

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
3355	16	6			Strapasson et al ?	Editorial. Copyedit to be completed prior publication.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
6805	16	6			Please correct citation.	Editorial. Copyedit to be completed prior publication.	Valasia Iakovoglou	International Hellenic University	Greece
14775	16	6			ref should be Stapasson et al. 2017	Editorial. Copyedit to be completed prior publication.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
21669	16	6			et al.	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
29933	16	6			et' -> 'et al.'	Editorial. Copyedit to be completed prior publication.	RAEHYUN KIM	Institute	Republic of Korea
43263	16	10			here you say 'increase in demand for ag land…' but above, keep saying that ag land has been flat. Need consistency from section to section; perhaps re-evaluate what is meant by the idea that no change occurred from the 1970s to present	Accepted, the text will be revised.	Deborah Lawrence	University of Virginia	United States of America
21671	16	15			et al.	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21673	16	21			et al.	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21675	16	27			Spaldy, 2017	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
5913	16	30			Should this be "biofuels" (implying liquid and gaseous transport fuels) or biomass? Need consistency in bth the chpater and throughout the report.	Accepted, the text will be revised.	Ralph Sims	Massey University	New Zealand
21677	16	36			Mbow, 2010	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
43265	16	39			numbers refer to % of what ag land? All land within a state? Within a country? Within a certain radius?	Accepted, additional information will be provided.	Deborah Lawrence	University of Virginia	United States of America
21679	16	40			Renneberg, 2010	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
1407	16	42			"land grabbing" is a loaded term that should be defined if it is used. It does not reflect well on the impartiality of the section that several of the references are not from peer-reviewed literature	Accepted, definition will be added to the text.	Jonah Busch	Earth Innovation Institute	United States of America
21681	16	49			Work, 2018	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21683	16	49			add more literature about land grabbing..	Accepted, additional information will be provided.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
9783	17	1	17	2	It would be nice to display these figures region- (contintent)wise.	Noted. This will be considered.	Jeanne Bormann	Ministry of agriculture	Luxembourg
46507	17	3	17	6	These 2 sentences contradict one another. If population is the major driver of land use change than why is the next sentence indicate that dietary changes account for 65% of land use change? The statement about population being the major cause of land use change is not supported.	Text will revised to improve clarity.	Rachel Bezner Kerr	Cornell University	United States of America
20035	17	4	17	4	"changes are": "change is"	Editorial. Copyedit to be completed prior publication.	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
9879	17	6	17	6	There again (see previous comments), consistency is needed. How can one reconcile 65% of land-use change due to livestock with 40% of deforestation from the four major commodities (including beef and soybean)?	Text will revised to improve clarity.	Valentin Bellassen	INRAE	France
9881	17	6	17	8	I don't understand the sentence. Livestock production has been intensified, not extensified. And how is this related to (human ?) population growth?	This depends on the region considered and the timeframe.	Valentin Bellassen	INRAE	France
17925	17	6	17	8	Unclear	Text will revised to improve clarity.	Luke Spajic	University of Adelaide (graduate student researcher), University of Oxford (visiting student researcher)	Australia
9785	17	7	17	8	The rate of extensification of animal production was found to have reduced more recently, principally due to the smaller effect of population growth. --> does this mean: "the rate of intensification of animal production was found to have increased more recently, …? How does this link up with the last part of the sentence "principally due to the smaller effect of population growth"?	Text will revised to improve clarity.	Jeanne Bormann	Ministry of agriculture	Luxembourg
30599	17	8	17	10	One source for this sentence: Weindl, I., Popp, A., Bodirsky, B. L., Rolinski, S., Lotze-Campen, H., Biewald, A., … & Stevanović, M. (2017). Livestock and human use of land: Productivity trends and dietary choices as drivers of future land and carbon dynamics. Global and Planetary Change, 159, 1-10.	Thank you, the reference will be considered.	Raychel Santo	Johns Hopkins Center for a Livable Future, Bloomberg School of Public Health	United States of America
9787	17	12	17	12	South and Southeast Asia, population pressure --> no comma between "South and Southeast Asia" and "population pressure" or say "In South and Southeast Asia, the population pressure …"	Editorial. Copyedit to be completed prior publication.	Jeanne Bormann	Ministry of agriculture	Luxembourg

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
16899	17	12	17	12	Please rewrite this sentence as "In the South and Southeast Asian countries, population pressure together with rapid economic development creates immense demand-driven pressure regarding land use. Hence, land is mostly converted from forest to agriculture and from agricultural areas to residential and urban uses."	Editorial. Copyedit to be completed prior publication.	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
46509	17	12	17	22	Population growth is not the same as economic change such as industrialization, and this paragraph seems to conflate the 2 and make statements which are not supported by the citations. Provide citations and a more rigorous assessment of the key drivers, rather than relying on an assumption that population growth is the main driver of land use change	Accepted, the text will be revised.	Rachel Bezner Kerr	Cornell University	United States of America
28993	17	12	17	27	As you mention, the deforestation itself might not caused by population and migration itself. It getting harder to explain as your "sample area" is too wide. You can make the example in smaller area. For example, in Indonesia, the land competition for settlement and industry are mostly in Java Island as the island is the most populated one. more specific example will be easier to understand	Noted, this will be considered in the revision of the text.	Marissa Malahayati	National Institute for Environmental Studies	Japan
16901	17	24	17	24	"Migration is also a significant" > "Human migration is also a significant..."	Editorial. Copyedit to be completed prior publication.	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
17927	17	24	17	24	It is not made clear why this is relevant	Text will revised to improve clarity.	Luke Spajic	University of Adelaide (graduate student researcher), University of Oxford (visiting student researcher)	Australia
1409	17	24	17	27	while true, what is the connection of this phenonomenon to AFOLU emissions?	Accepted, the text will be revised.	Jonah Busch	Earth Innovation Institute	United States of America
9789	17	25	17	25	Rather use "rate of migrants" instead of "stock of migrants"	Editorial. Copyedit to be completed prior publication.	Jeanne Bormann	Ministry of agriculture	Luxembourg
9791	17	29	17	33	Does this include fracking?	Fracking was not included.	Jeanne Bormann	Ministry of agriculture	Luxembourg
1621	17	36	17	36	Not sure about the use of the word 'induced'. Should this be 'increased'?	Editorial. Copyedit to be completed prior publication.	Jenkins Rhosanna	University of East Anglia	United Kingdom (of Great Britain and Northern Ireland)
29167	17	44	17	50	Further reference might be needed to back the impact of mining on deforestation in Africa. Figures in absolute value might be useful.	Accepted, additional references will be included.	SMAIL KHENNAS	Energy and Climate Change Consultant	United Kingdom (of Great Britain and Northern Ireland)
9793	17	47	17	49	Is it relevant to mention at the "district level", as the readers may not be familiarized with the political subdivision of the country, the states?	Editorial. Copyedit to be completed prior publication.	Jeanne Bormann	Ministry of agriculture	Luxembourg
9475	17	27	18	26	I agree that infrastructure (mining, dams, roads, urbanization) and the related land use management could be effective mitigation way. However, roles of such activities in climate change/GHG emissions still remain large uncertainty due to lack of scientific data/knowledge. I suggest to add some contents or analysis on uncertainty of these actions.	If available, this information will be included.	Minghua Zhou	Institute of Mountain Hazards and Environment, Chinese Academy of Sciences	China
32867	17	29	18	26	It would be helpful to give an indication of which among these four infrastructure has the biggest impact. Perhaps generalizing for the whole world is too much but there is regional data that are illustrative, e.g., in Brazil, roads in the Amazon serve as the "lead" that allow subsequent mining, crop land, and major land use change.	Accepted, regional details will be included, if available.	Cheah Singfoong	Independent consultant, formerly more than 10 years with the National Renewable Energy Laboratory, USA	United States of America
37041	17	29	18	26	There is denial of the observed facts however, it gives a wrong impression that as if this is a new phenomenon of this century. This whole paragraph ignores the fact that it is a historical development pathway and is only reflecting the path of development that emerged after industrial revotuion. So this happenend in all other countries earlier now also similar trend continuing. Unless it is set in the bigger hostorical developmnet narrative actions will be very misplaced as narrative itself is fragmented. needs to be placed in broader context and narrative. Top ten producers and consumers of gold are not the countries mentioned here. Top ten gold producing countries are China, Australia, US, Russia.... (any google search produces that. So refered journal papers bring in biases away from reality. Regionally balanced views may be useful for IPCC report.	Noted, but the paragraph refers to the impacts on deforestation in tropical regions where gold mining is a significant driver of change.	Joyashree Roy	Asian Institute of Technology, Thailand. Jadavpur University, India	Thailand
43269	17	3			again, need for consistency on message about land change. here you say population was a driver of land change since '87; but above there were contradictory statements about lack of change in ag land. It may all make sense, with the right context (global/regional?) but I keep getting tripped up by the apparent contradictions.	Text will revised to improve clarity.	Deborah Lawrence	University of Virginia	United States of America
21685	17	12		22	pls add more newest literaute based on research study from others countrys	Accepted, regional details will be included, if available.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21687	17	18			Faustat, 2017	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
43271	17	24			doesn't come to a broader point about land change/emissions	Editorial. Copyedit to be completed prior publication.	Deborah Lawrence	University of Virginia	United States of America
21689	17	37			among literature (;)	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21691	17	39			Rupayachi, 2017	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
21693	17	44		50	need more data about mining in southest asia	Accepted, regional details will be included, if available.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
43273	17	44			put some numbers on mining in here; they are very small compared to ag and forest management; you need to say that to help guide the reader as to what the biggest drivers of emissions are	Accepted, the information will be added.	Deborah Lawrence	University of Virginia	United States of America
29757	17	49			Rajan, 2019; Add this article to the reference	Editorial. Copyedit to be completed prior publication.	RAEHYUN KIM	Institute	Republic of Korea
21695	17	50			missing 'l' shoud be et al.	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
35137	17	52			(Pfaff et al. 2007; Rudel et al. 2009; Ferretti-Gallon and Busch 2014) instead of (Pfaff et al. 2007, Rudel et al. 2009, Ferretti-Gallon and Busch 2014)	Editorial. Copyedit to be completed prior publication.	Happiness Nnko	The University of Dodoma	United Republic of Tanzania
21697	17	53			among literature (;)	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
29741	17	53			Pfaff et al. 2007; Add this article to the reference	Editorial. Copyedit to be completed prior publication.	RAEHYUN KIM	Institute	Republic of Korea
28077	18	27	12	19	Too much words in the box, make it more concise	Editorial. Copyedit to be completed prior publication.	Alix Frank Rodrigue Idohou	National University of Agriculture	Benin
16903	18	15	18	15	Pls change sentence to: "Urbanization is one of the most remarkable features of global social development and also has significant effects on forest resources and land use"	Editorial. Copyedit to be completed prior publication.	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
2277	18	15	18	20	This paragraph can be further enriched. There are more paper on the effects of urbanization on the land use change. Plese assess and cite them. The author can assess to enhance this paragraph: Arfanuzzaman, M. and Dahiya, B. 2019. Sustainable Urbanization in Southeast Asia and Beyond: Challenges of Population Growth, Land Use Change and Environmental Health, Journal of Growth and Change, vol. 50 (2), doi:10.1111/grow.12297	Thank you for the reference, it will be considered in the revision of the text.	Md Arfan Uzzaman	FAO	Bangladesh
45081	18	15	18	20	The impacts of urbanization may be further emphasized also considering related points of emphasis in the Special Report on Climate Change and Land, such as "management of urban sprawl can help reduce the environmental impact of urban systems" (page 63 of the Technical Summary) and "urban zoning" (page 706 of Chapter 7) with other relevant referrals.	Thank you, previous reports will be considered.	Siir Kilkis	The Scientific and Technological Research Council of Turkey	Turkey
16629	18	22	18	22	I think that the deforestation coverage could be reduced some with perhaps one discussion of drivers rather than repeatedly hitting it by continent	Comment was not very clear.	Bruce McCarl	Texas A & M University	United States of America
6815	18	22	18	26	I would suggest avoiding using only one sentense for a whole paragraph. Maybe conecting it with the previous paragraph as one?	Editorial. Copyedit to be completed prior publication.	Valasia Iakovoglou	International Hellenic University	Greece
6269	18	34	18	34	Comment: Road and other transport infrastructure are not the only most direct and immediate driver of deforestation. There is a need to acknowledge others by starting with the word ‘among the’	Rejected, the paragraph specifies where roads are significant drivers.	Brown Gwambene	Marian University College	United Republic of Tanzania
33079	18	36	18	51	Check refrence: (…….Laurance & Burgues 2017); it has different style	Editorial. Copyedit to be completed prior publication.	Mirzokhid Mirshadiev	Wageningen University and Research	Netherlands
39619	18	28	19	12	Excellent choice of case study! Would be enhanced if some thought could be given to if (and how) the expansion of road networks could not just be managed - but be used as an actual INSTRUMENT to increase sustainability and conservation within biodiversity and biodiversity hotspots	Thank you, this will be considered but the focus is on emission impacts.	Shobha Maharaj	Independent Consultant	Germany
16579	18	22			I think that the deforestation coverage could be reduced some with perhaps one discussion of drivers rather than repeatedly hitting it by continent	Comment was not very clear.	Bruce McCarl	Texas A & M University	United States of America
43275	18	3			as stated later in the paragraph, I would start with a more explicit statement that it is not the clearing associated with the road itself but rather the associated in-migration that follows.	Accepted, the text will be revised.	Deborah Lawrence	University of Virginia	United States of America
43279	18	5			roads are also built for legal logging and legal ag expansion. And even if they are legal, the roads can have bad consequences. So make that clear--not just the legality that is an issue	Accepted, the text will be revised.	Deborah Lawrence	University of Virginia	United States of America
3357	18	6			the dot after forests must be erased	Editorial. Copyedit to be completed prior publication.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l’environnement	France
6811	18	6			Please fi the typo "forests. (Kleinschroth and Healey, 2017).", erase the "." after the word "forests"	Editorial. Copyedit to be completed prior publication.	Valasia Iakovoglou	International Hellenic University	Greece
22637	18	6			Extra period after forests should be omitted.	Editorial. Copyedit to be completed prior publication.	Melissa Lucash	Portland State University	United States of America
22639	18	8			Omit "and before sediment	Editorial. Copyedit to be completed prior publication.	Melissa Lucash	Portland State University	United States of America
22641	18	10			Change to “Some roads initially build for logging become…”	Editorial. Copyedit to be completed prior publication.	Melissa Lucash	Portland State University	United States of America
14779	18	11			should be "conversion of forest to agricultural land"	Editorial. Copyedit to be completed prior publication.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
22643	18	12			I would say “efficient forest harvesting”, not exploitation which has a very negative connotation and denotes something illegal or improper.	Editorial. Copyedit to be completed prior publication.	Melissa Lucash	Portland State University	United States of America

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
3359	18	13			maybe "see the case study XX"	Editorial. Copyedit to be completed prior publication.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
22645	18	15			Why is urbanization listed here rather than following the section on population growth?	Accepted, it will be changed.	Melissa Lucash	Portland State University	United States of America
6813	18	18			I would suggest adding a more updated reference than (Becker, 2001, 2004 sine we have 2020.	Accepted, additional references will be included.	Valasia Iakovoglou	International Hellenic University	Greece
3361	18	20			what is urbanization of 37% (of what?)	Noted, this will be considered in the revision of the text.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
43277	18	20			context needed: 37% of what to 73% of what? urban land globally is about 1% of the land surface. Not huge. Again, make your point in context of how big this is compared to other drivers of AFOLU emissions. Help reader understand what are the big ones and what are not big.	Noted, this will be considered in the revision of the text.	Deborah Lawrence	University of Virginia	United States of America
21699	18	22		26	location of study?	Amazon	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
43281	18	25			just be mindful that in the developed world, urbanization is thought to represent higher well being along several metrics and as a mitigation strategy, it is big: urban dwellers have lower emissions (in developed countries). So maybe a note about regional differences here.	Noted, this will be considered in the revision of the text.	Deborah Lawrence	University of Virginia	United States of America
9577	18	28			Box 7.1 addresses a very important and relevant issue, but the presentation and wording is at odds with a scientific assessment and reads more like an activist NGO product. Cause and effect of expanding roads, and root causes of the phenomenon, are not clearly presented and the expansion comes forward as an independent "evil force". Use of the word "tsunami" is not appropriate for the gradual, widespread processes at hand, and seems to be used to raise an alarmist flag - not in line with IPCC	Accepted, revision will be discussed with the contributing author.	Tom Kram	PBL (Fellow)	Netherlands
10427	18	28			The box is full of value-laden and policy-prescriptive language - please revise substantially or consider deletion. The box is also ot clear about causal connections. Surely the cause of deforestation are the activities that are served by roads, not the roads in themselves - they may be a useful indicator but not a useful target for policy action (as the decision would have to be not to have mining, not to open up conservation forests for commercial development, rather than simply not having roads).	Accepted, revision will be discussed with the contributing author.	Andy Reisinger	NZAGRC	New Zealand
22647	18	32			End sentence after Watson et al 2016. Then say "Seventy percent of… " and the extent of fragmentation in tropical forests is…".	Editorial. Copyedit to be completed prior publication.	Melissa Lucash	Portland State University	United States of America
29899	18	32			Waston et al. 2016; Add this article to the reference	Editorial. Copyedit to be completed prior publication.	RAEHYUN KIM	Institute	Republic of Korea
21701	18	36			comma before 2017	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21703	18	38			comma before 2013	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21705	18	40			comma before 2017	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21707	18	48			comma before 2017	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21709	18	51			comma before 2017	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
29599	18	51			Flyvberg 2009; Add this article to the reference	Editorial. Copyedit to be completed prior publication.	RAEHYUN KIM	Institute	Republic of Korea
17129	19	4	19	4	The meaning of "modern infrastructure tsunami" is unclear. Please add the explanation of this word.	This is figurative language to present the large increase of infrastructure projects.	KEIICHI IGARASHI	Mitsubishi UFJ Research and Consulting Co., Ltd.	Japan
22649	19	4			Why are you discussing tsunamis here?	This is figurative language to present the large increase of infrastructure projects.	Melissa Lucash	Portland State University	United States of America
26859	20	5	20	5	Land is a sink for CH4 as well.	Accepted.	Louis Verchot	International Center for Tropical Agriculture	Colombia
10579	20	5	20	6	Land is also a sink of atmospheric methane. I thus recommend the sentence revised as "The land is a source and sink of CO2 and CH4 and a source of N2O due to …"	Accepted.	Wen Zhang	Institute of Atmospheric Physics, Chinese Academy of Sciences	China
38689	20	7	20	7	What you mean by direct observation, can yo elaborate more on?	Accepted, text moved, but refer to direct measurements.	Maria Jose Sanz Sanchez	Basque Center for Climate Change	Spain
12219	20	8	20	13	Other loss processes are missing here.	Noted: the reviewer does not suggest what other losses should be included.	Mohammad Ibrahim Khalil	University College Dublin	Ireland

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
47585	20	9	20	13	The presnetation is questionable. The Kyoto protocol required the differentiation between two categories: "direct human-induced" emissions/removals versus "indirect or natural". It did not require a differentiation between indirect and natural. The "direct" did not include age-class effects (it is explicitly under indirect). But the Protocol is no longer in force, and the differentiation between direct and indirect was considered not to be possible (and it still is not).	Accepted. We agree with the reviewer in fact part of the point we make is that the differentiation between these categories is not possible with direct measurement/observation. Agreed that the KP is no longer in effect, but the issues go beyond the KP to what id being done in the modelling and inventory community going forward and how to understand different flux estimates and the interpretation of the definition of "anthropogenic".	Zoltán Rakonczay	European Commission, Directorate General for Research	Belgium
38691	20	9	20	14	Fluxes are the result of biological and non biological processes. The three componenes you mention are the fluxes that are beyond natural with no disturbances. This may need to be clarified better in the sentence,	Noted - thank you. Consideration will be given to the classification of emissions.	Maria Jose Sanz Sanchez	Basque Center for Climate Change	Spain
9795	20	12	20	12	windrow? Not sure to which extent "windrow" is the correct terminology used.	Accepted, changed to windthrow	Jeanne Bormann	Ministry of agriculture	Luxembourg
17263	20	12	20	12	Please check: do you mean "windthrow"?	Accepted	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany
9797	20	15	20	15	refs - missing references	Accepted	Jeanne Bormann	Ministry of agriculture	Luxembourg
16905	20	15	20	15	refs: Please fill in.	Accepted	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
38693	20	15	20	17	Suggest to elaborate more on which apporaches are more realted to wich scales (country or global / top dow or bottom up)	Accepted. More detail is given in the text and in the SRCCL whether the methods are applied globally (models) or by country (NGHGI and FAO) but to note all of these methods can be applied at the country scale at sub scales or used with global data.	Maria Jose Sanz Sanchez	Basque Center for Climate Change	Spain
28079	20	16	20	17	What about the Eddy co-variance method?	Accept with modification, text removed, but different estimates from different methods assessed below. however to note eddy covariance does not produce global flux estimates, but can provide information relevant to other (e.g. modelling) approaches.	Alix Frank Rodrigue Idohou	National University of Agriculture	Benin
12221	20	19	20	26	There is a data error, please cross check.	Accepted, all numbers updated	Mohammad Ibrahim Khalil	University College Dublin	Ireland
29169	20	19	20	26	For the net emissions information on emissions (+)and sinks (-) is useful.	Accepted, all numbers updated	SMAIL KHENNAS	Energy and Climate Change Consultant	United Kingdom (of Great Britain and Northern Ireland)
22151	20	20	20	20	Subscript on GtCOse-1yr-1	Accepted, all numbers updated	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
31985	20	20	20	20	total global anthropogenic GHG emissions ' should be total net global anthropogenic GHG emissions'? As it is the same as 'total global net GHG emissions' stated in line 19, I assume this considers the sinks.	Accepted, all numbers updated	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
11281	20	22	20	25	What may be the reson fo this? Why is it constant	Accepted, referred the reader to sections below and drivers section	Mahmood Riyaz	Maldivian Coral Reef Society	Maldives
12223	20	28	20	35	There seems to be less concern about the indirect emission particularly N2O through other N loss processes occruing in the system (indirect emissions).	Accepted. N2O emission from indirect sources (e.g. ammonia) are accounted for under agricultural emissions	Mohammad Ibrahim Khalil	University College Dublin	Ireland
27983	20	28	20	35	This section and chapter claim that only CO2, CH4, and N2O from land use change have an appreciable impact on climate. However, this is incorrect and highly misleading. Biomass-burning black and brown carbon (including tarballs), together with heat and moisture fluxes, are responsible for about 40% of warming from biomass burning: Jacobson, M.Z., Effects of biomass burning on climate, accounting for heat and moisture fluxes, black and brown carbon, and cloud absorption effects, J. Geophys. Res., 119, 8980-9002, doi:10.1002/2014JD021861, 2014 http://web.stanford.edu/group/efmh/jacobson/Articles/VIII/bioburn/14BburnJGR.pdf IAMs do not even account for these processes so can't be relied on to provide basic information on this topic.	Noted. Discussion will be presented on short-lived climate forcers and biophysical effects.	Mark Jacobson	Stanford University	United States of America
9799	20	29	20	29	Missing comma: Land Use Land Use Change and Forestry	Accepted	Jeanne Bormann	Ministry of agriculture	Luxembourg

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
38925	20	29	20	30	Please find a way to introduce LULUCF as a concept earlier, at the outset of this chapter. So far you only have spoken about ''AFOLU''. Note that in AFOLU as a concept, the part od land use and and use change linked to agriculture should stay under the ''A" of the acronym, hence there is no equality between ''FOLU" and ""LULUCF".	Accepted, we have avoided using AFOLU this time around, and only speak about the more broadly recognised terms LULUCF and Agriculture. We separate sub sections by gas and try to be clear for each gas what is LULUCF related and what is Agriculture related. We do not describe LULUCF earlier, but this entire section now comes earlier in the chapter	francesco tubiello	FAO	Italy
2935	20	30	20	32	In addition to the direct anthropogenic CO 2 net emissions from 33 LULUCF/FOLU, we also present the net flux due to indirect effects i .e. the natural response of land to 34 human -induced environmental change in 7.3.2. A (Not clear for the readers and policy personals)	Accepted. Wording changed	Adnan Arshad	China Agricultural University	China
16911	20	31	20	31	Why is CO2 not mentioned for agricultural buring?	Accepted. As plants take up CO2 during growth which is released during burning, crops are considered to be climate neutral unless soil carbon is being gained or lost. Estimates are presented for soil carbon flux from agricultural management.	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
16909	20	32	20	32	There is no section 7.3.3, please correct.	Accepted	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
9801	20	33	20	34	"we also present the net flux due to indirect effects i.e. the natural response of land to human-induced environmental change in 7.3.2." --> rephrase: "the net flux due to indirect effects i.e. the natural response of land to human-induced environmental change is presented in chapter 7.3.2."	Accepted	Jeanne Bormann	Ministry of agriculture	Luxembourg
46231	20	5	22		Hisorical and Current trends in GHG Emissions and Removals. It would be helpful to add a section on the historic trends relating to the condition of forest carbon stocks and their relative vulnerability to premature release of carbon to the atmosphere (Mackey et al 2020). The five year assessment report of the New York Declaration on Forests noted that the continued loss of primary forests, at ever increasing rates, despite their incalculable value and irreplaceabiluty is both shocking and tragic (NYDF Asssessment Partners. 2019. 'Protecting and Restoring Forests: A Story of Large Commitments yet Limited Progress. New York declaration on Forests five Year Assessment Repiort. Climate Focus. (coordinator and editor). The CBD (COP 14/30) gave new emphasis to the importance of primary forests when it noted "the urgent necessity to avoid major fragmentation, damage to and loss of primary forests of the planet..."And (2020) IUCN Policy on 'Primary Forests including Intact Forest Landscapes" are all relevant. It is false to assume that maintaining or increasing forest cover at the expense of primary and carbon dense natural forests and other ecosystems is without consequences for stable long term carbon storage and risk of premature release of carbon to the atmosphere.	Accepted. Many of the methods assessed in this chapter include flux estimates for the replacement of primary forests with secondary forests. In the inventories loss of primary forest is reported separately to planting or regeneration of forests. For models when they implement wood harvest, several will have different values if that harvest comes from primary forests or secondary forest that have not yet recovered their biomass. IPCC Tier 1 and the FAO include methods based on carbon stock change. Models also consider carbons stock of the forest being deforested.	Virginia Young	Australian Rainforest Conservation Society, Griffith University, CAN Ecosystems	Australia
26857	20	1	29	12	This section is taken almost directly from the SRCCL. It seems unnecessary to repeat that analysis, and even if some of the numbers can be updated, the take home message is not changed. The global carbon project will do a lot of this anyway. It would be more interesting to use this section to say things that were not said in the SRCCL. For example, could the authors explore regional differences in emissions trends more and look at projections for the future (expand 7.3.2.3)? There is interesting new research on the CO2 sink in tropical dry forests (Sitch et al., 2015), for example, that was not dicsussed in detail in the SR. The impacts of Amazonian fires overwhelming the emissions signal from reduced deforestation (Brando et al. 2020, Science Advances) is also an issue to discuss. Emissions from permafrost and wetlands could be explored more deeply. Biophyscial feedbacks could be integrated with biogeochemical mechanims for a more complete picture of LUC impacts on the climate (see comment above on SLCFs). Natural sources of N2O and CH4 could be explored more. The impacts of mitigation measures could be analyzed.	Accepted. Extensive changes are planned for this section and there will be emphasis on regional emissions. Thank you for the suggested references. Discussion on the Amazonian fires will be considered, though this may be relevant in 7.3. A subsection on biophysical effects is also planned.	Louis Verchot	International Center for Tropical Agriculture	Colombia
28785	20	2	29	12	The section 3 entitled: Historical and current trends in GHG emission, but the history of GHG emission was not well monitored. I excepted I can found trend of GHG emission during the years, but coud not find, escept some information in Figures 7-14 and 7-15 and also a paragraph in Page 27. In this section, the regional trends are well-discussed, and except similar act for historical trends. I think history of GHG is more important than geographical disstribution.	Accept with modification. WGIII deliberately only looks at more recent emission over the past few decades, a fuller historical view is covered in WGI and is now referenced in the text. This is because of the focus more here on mitigation efforts.	Alireza Yazdani	Shiraz University	Iran
47583	20	2	29	12	Section 7.7: the section shoudl give a poper historical overview, from prehistoric reconstructions through the Industrial Revolution and 19th century to recent past. Most of the issues discussed are relatively recent and almost totally irrelevant in their impact and importance compared to other factors, policies and processes not mentioned (like forest legislation, agricultural support schemes, afforestation programmes, etc.)	Accept with modification. WGIII deliberately only looks at more recent emissions over the past few decades, a fuller historical view is covered in WGI and is now referenced in the text. This is because of the focus here on mitigation efforts. Policies and processes are included later on in this chapter.	Zoltán Rakonczay	European Commission, Directorate General for Research	Belgium
22651	20	6			Just say “It is impossible…” then cite IPCC.	Accept with revision, text changed	Melissa Lucash	Portland State University	United States of America
22653	20	11			Add "and before N	Accept with revision, text moved from here until after 'n' introduced	Melissa Lucash	Portland State University	United States of America

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
3363	20	12			I don't understand the meaning of "windrow" here	Accept changed to 'Windthrow'	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
22655	20	13			Different methods also exist for the natural disturbances	Reject, the focus here is on anthropogenic, methods for assessing sinks and total fluxes are discussed in detail below	Melissa Lucash	Portland State University	United States of America
3365	20	15			(refs) to complete	Accepted	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
12671	20	19		20	The numbers also should be given separately as Agriculture and LULUCF.	Accepted, they are presented in the revised table.	Eray Özdemir	General directorate of Forestry	Turkey
14781	20	19			UNFCCC data sets should also be considered where different countries report their GHG inventories. EDGAR and FAO are reporting based on tier 1 approach, whereas countrywide reporting may be using higher tiers also. A comparision of EDGAR,FAO and UNFCCC can also be done.	Accepted, this is done in the text and figures, but note EDGAR LULUCF is not available at time of writing	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
3367	20	20			GtCO2e yr -1 and not GtCO2e-1 yr-1	Accepted	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
20157	20	20			23%: don't forget to mention uncertainty range	Accepted	Henry Neufeldt	UNEP DTU Partnership	Denmark
35139	20	20			GtCO2eyr-1 instead of GtCO2e-1yr-1	Accepted	Happiness Nnko	The University of Dodoma	United Republic of Tanzania
22657	20	21			Omit "off, just saying it's the "net anthropogenic…"	Accepted	Melissa Lucash	Portland State University	United States of America
10429	20	22			"the estimate is similar…" - why only similar? Either you re-state the SRCCL conclusions, or you modify it - in the latter case, you need to explain why and how the result differs from that in the SRCCL.	Accepted	Andy Reisinger	NZAGRC	New Zealand
6817	20	25			Please check "The emissions estimates remain…". It should be "The emission's estimates remain…" or "The emissions' estimates remain…"	Accepted with modification	Valasia Iakovoglou	International Hellenic University	Greece
22659	20	26			Add comma after applied.	Accepted	Melissa Lucash	Portland State University	United States of America
29935	20	29			Please insert "," between 'Use' and 'Land'. "Land Use, Land Use Change and Forestry"	Accepted	RAEHYUN KIM	Institute	Republic of Korea
3369	20	44			in the note, it is EDGAR and not EGDAR	Accepted	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
17413	20				It should be note summary of methods and formulas which have been used for estimates	Accept with modification, this was provided in detail in the IPCC SRCCL (2019), the reader is referred there for the details. the reader is now specifically referred to the section in SRCCL	Zeyaeyan Sadegh	Islamic Republic of Iran Meteorological Organization (IRIMO)	Iran
20037	21	0	21	0	Table 7.1: agriculture doesn't seem to have the CO2 emsisions from burning and lime applciation	Accept with modification. as plants take up CO2 when growing, CO2 lost on burning is treated as carbon neutral unless there is also land use change. However estimates have been added for CO2 flux from cropland and grassland management to the text. In the models it is included in the LULUCF number. We have also clarified this in the text	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
20039	21	0	21	0	Table 7.1: it is not very clear what does Panel 2 show	Noted. This table will be revised and in collaboration with Chapter 12 which will deal with food systems	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
38927	21	1	21	3	I do not quite understand why AR6 is waiting for EDGAR while there are altenatives to already compute now the total anthropogenic emissions, for instance PRIMAP--which was alerady used in the SRLCC	Noted. This table was a place holder and will be replaced with an updated version.	francesco tubiello	FAO	Italy
2937	21	1	21	4	The layout of the table contain too many information and details. It is suggested to use R (cupola) to disply the data and information	Reject. The table was developed at the request of policy makers for SRCCl and developed in conjunction with them. However it is being updated for SRCCL. we are not sure why R would give a better display.	Adnan Arshad	China Agricultural University	China

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
12039	21	3	21	3	Please include more information in footnote 7 about what is included and what is not included	Accept with modification, It is not clear what further information is required as it already states what the flux includes and the models it is based on, however reference has been added to the relevant science literature	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
12041	21	3	21	3	It is somewhat unclear if the column to the right ("Net land - atmosphere flux from all lands) actually includes all fluxes (natural and human-induced) from ALL lands. It would be interesting to know what the total net land - atmosphere from all lands are. Please clarify.	Reject, It is stated that it includes ALL lands in the heading. Also it states that the column is s the sum of A (anthropogenic fluxes) and G Natural fluxes. Therefore we feel its clear it is all fluxes from all lands. this is also discussed int eh text	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
12065	21	3	21	3	Please include more information in footnote 6 about what is included and what is not included	Reject. It is not clear what further information is required, to already states what is included. however reference has been added to the relevant science literature	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
27139	21	3	21	3	Why are total numbers in Panel 2, 6th column (Non AFOLU…) given as a range rather than as a mean +/- uncertainty? I suggest to harmonize the result presentation.	Accept with modification, it was not possible to give a mean and SD as the numbers from a range across different literature sources. However numbers are being modified for the Second Order Draft and will be included in Chapter 7 where they are discussed in more detail	Marc Aubinet	University of Liege	Belgium
27141	21	3	21	3	I had difficulties to understand how numbers in panel 2 colums 7 (total global food system emissions, 10.8-19.1) were computed. Finally, I found they were obtained by combining quadratically columns 3, 4 and simply summing the range of this result with column 6. This computation (maybe justified) appears quite complicated and not very transparent, which could raise critics. It should be explained and justified in the legend.	Noted. This table will be revised and in collaboration with Chapter 12 which will deal with food systems	Marc Aubinet	University of Liege	Belgium
21711	21	1		3	Table title is too long	Noted. The title will be revised	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
9579	21	1			Table 7.1 is not easy to digest, and may need more explanantion and guidance. For example, in the top panel column F=(C/E), but in the lower panel F says 21-37% while column C is empty, but 0% is not right, but what is it then? What is different between LULUCF emissions between the top panel (5.2) and bottom panel (4.9) and why is all of the latter assigned to the food system?	Noted. This table will be revised and in collaboration with Chapter 12 which will deal with food systems	Tom Kram	PBL (Fellow)	Netherlands
3371	21	2			table 7.1 what is the "1" after (2007-2016) ?	Accepted, it is a reference to a footnote, clarified in update.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
22661	21	45			Extra) after emissions	Accepted (note comment should refer to page 22)	Melissa Lucash	Portland State University	United States of America
22663	21	51			What is the X after 14?	Accepted (note comment should refer to page 22)	Melissa Lucash	Portland State University	United States of America
22665	21	61			. "show different trends…" seems redundant with the previous sentence.	Accepted (note comment should refer to page 22)	Melissa Lucash	Portland State University	United States of America
20159	21				Last rows, columns 6 and 7: please use the same form of presentation to avoid confusion, ie average +/- range	Noted. This table will be revised.	Henry Neufeldt	UNEP DTU Partnership	Denmark
38695	21				Table 7.1 is confusing. It prvides fundamental information that needs to be very trasparent and easy to be recontructed.What is the source/sources and if many how are used to come withthe fina estimation in panel 1, FAOSTAT and EDGAR? please introduce a reference. Why you intorduce the contribution to the global food system here, and how the estimates are derived form which sources. How Panel 1 and 2 estimates need to be considered, giving the fact that in the food systems there is double counting wiht other sectors?	Noted. It is planned to extensively revise this table. The food systems section will now be covered in Chapter 12.	Maria Jose Sanz Sanchez	Basque Center for Climate Change	Spain
11283	22	1	22	37	Footnote/Explanations are too long, can you shorten this or include in the text???	Reject: footnotes are necessary to understand the results and the table needs to stand along, other reviewers have asked for more detail.	Mahmood Riyaz	Maldivian Coral Reef Society	Maldives
9803	22	2	22	2	Footnote 2 has been shifted.	Accepted	Jeanne Bormann	Ministry of agriculture	Luxembourg
10539	22	7	22	8	Footnote 2 is missing.	Accepted	Hiroko Akiyama	National Agriculture and Food Research Organization	Japan
41343	22	28	22	31	The difference between biogenic and fossil CH4 can be explained and clarified in earlier in the chapter, and then this explanation can be referred to later if needed.	Accept with modification: there is a cross chapter box on GHG metrics, this footnote will be revised to refer to that	Jan Fuglestvedt	CICERO	Norway
16915	22	28	22	48	There is no mention of forest area change in figure 7.11.	Reject: forest area changes is discussed int the text as reasons for the flux. AFOLU includes forest area change.	Ranjith Gopalakrishnan	University of Eastern Finland	Finland

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
16913	22	41	22	41	Why is "non-anthropogenic fluxes" also included here, in this section? At page 20, line 28, it is said that this section talks only about anthropogenic AFOLU fluxs.	Reject: Non- anthropogenic fluxes are included here as the land is an important sink for anthropogenic emissions and the trend of that sink is important for understanding the persistence of emissions in the atmosphere. The whole section is titled such that the natural flux is not included. The text referred to is merely explaining the connection with regards to anthropogenic fluxes and is not a section heading.	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
38929	22	41	22	41	I do not understand why non-antrhopogenic fluxes are a subject of interest to a WGIII chapter. These should be more appropriately discussed in WGI, and perhaps only referred to here for completeness or clarity, without having its own sub-chapter title. Otehrwise things become quite confusing to the reader.	Reject: Non anthropogenic fluxes are included here as the land is an important sink for anthropogenic emission and the trend of that sink is important for understanding the persistence of emissions in the atmosphere. It is important to understand this sink service in the AFOLU chapter as any AFOLU activities could impact this natural sink. It is also important in the context of understanding the reconciliation between inventories and global models with regards to the shift of what is considered natural or anthropogenic sink.	francesco tubiello	FAO	Italy
38957	22	44	22	57	I feel that using two models for this estimation is not accurate and it should be stressed in this paragraph somehow.	Accept with modification: there are now three models used for the global estimate, although only two are available regionally. The uncertainties are shown on the figure and in the text. The low confidence we have in the models is reflected in the comment below that we have low confidence in the trend in global AFOLU CO2 emissions	Vassilis Litskas	Cyprus University of Technology; Open University of Cyprus	Cyprus
27601	22	46	22	46	Reference missing in chapter 7 bibliography: Friedlingstein et al, 2019	Accepted	Dorota Retelska	Independent	Switzerland
27603	22	47	22	47	Reference missing in chapter 7 bibliography: Hansis et al. 2015	Accepted	Dorota Retelska	Independent	Switzerland
16917	22	51	22	51	15.x: Pls correct.	Accepted	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
31991	22	51	22	51	Please check the x after 15 in: '15.x '	Accepted	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
46187	22	51	22	51	15.x Gt CO2 yr-1	Accepted	Daniel Ortiz-Gonzalo	Department of Geosciences and Natural Resource Management, Faculty of Science, University of Copenhagen	Denmark
31987	22	52	22	52	FAOSATAT ' you mean 'FAOSTAT'	Accepted	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
38625	22	44	24	38	Although the global models including bookkeeping model are very useful to provide global estimate, these not always provide good analysis in each country level. For instance, removals affected by age class structure cannot be captured by the global models. Thus at the beginning of the section, it seems worth explaining the fact that there is no single tool or method providing most credible estimate, each models or tools have pros and cons and thus considering the results from different models and tools can gives us a certain range of estimates.	Noted. Thank you. Consideration will be given to emphasising shortcomings & benefits of different approaches.	Atsushi Sato	Mitsubishi UFJ Research and Consulting Co.,Ltd.	Japan
38697	22	61	24	20	Section 7323: this section is very important to ensure the trasparency of the models and methods and the comparability of results. It will be very helpful to iclude a good table that helps to follow the narrative by comapring the different models used and that they include anfd what not with the most appropiated references.	Noted. The authors thank the reviewer for their suggestion which will be considered.	Maria Jose Sanz Sanchez	Basque Center for Climate Change	Spain
12679	22	13			there should be section for land use of world and figure (Total forest land of the world, total cropland of the world etc)	Reject, this section is about fluxes. It deals with trends over time. Land areas change over time, this is included in the Drivers Section. We refer more to that section.	Eray Özdemir	General directorate of Forestry	Turkey
14783	22	30			shoiuld be (30 as per AR5).	Accepted. This will be changed.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
22667	22	30			How many DGVM runs? With different models or different climate scenarios or different land scenarios?	Comment appears out of place, but the text will be checked.	Melissa Lucash	Portland State University	United States of America

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
3373	22	37			nutrition and food loss and wastage.	Noted. This will be changed.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
3375	22	45			one bracket is missing	Accepted	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
29635	22	47			Hansis et al. 2015; Add this article to the reference	Accepted	RAEHYUN KIM	Institute	Republic of Korea
29937	22	48			The Figure 7.11 does not show 'forest area change'. It showes 'Global net CO2 emissions due to AFOLU from different approaches'.	Accepted	RAEHYUN KIM	Institute	Republic of Korea
3377	22	51			sink of 15.x GtCo2 yr-1	Accepted, numbers have been revised.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
3379	22	52			FAOSTAT, not FAOSATAT	Accepted	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
29647	22	57			Hooijer et al. 2010; Add this article to the reference	Accepted	RAEHYUN KIM	Institute	Republic of Korea
29759	22	57			Randerson et al. 2015; Add this article to the reference	Accepted	RAEHYUN KIM	Institute	Republic of Korea
1933	22				Section 7.3.2 provides a very useful assessment of the difference between land emissions/sinks of national inventories vs book-keeping and model studies and figure 7.11 is particularly informative and I suggest retaining. It would be useful if this section included a reference forward to section 7.8 where the translation between these different estimates is discussed. It would also be useful if some further discussion was included on the relation between carbon budget estimates and this issue was included either here or in section 7.8.	Accepted, 7.8 has been merged with this section	Haroon Kheshgi	ExxonMobil Research and Engineering Company	United States of America
18143	23	35	15	7	The phenomena descibed here are very important, but it is not clear in what sense they represent a driver, respectively what drives what or is driven by what?	Noted. It is a little unclear what the reviewer refers to. It is suspected that the page numbers may be incorrect.	Helmut Haberl	Institute of Social Ecology, University of Natural Resources and Life Sciences, Vienna	Austria
22153	23	1	23	2	Is it possible to add "but high uncertainty" following "low confidence"	Reject, with IPCC terminology low confidence incapsulates high uncertainty	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
38823	23	4	23	5	The sentence references FOLU activities in Fig 7.11 but the caption references AFOLU. Please clarify.	Accepted	Julian Reyes	Personal Capacity	United States of America
1411	23	4	23	17	while the IPCC might be too politic to say it out loud, there's another difference here too. The satellite-based studies are in the peer-reviewed scientific literature, while the FAO-FRA is the aggregation of self-reported data from national forestry ministries who often have an interest in portraying deforestation as declining, even to the extent of making post hoc changes to previously released data. see e.g. Granger PNAS 2008.	Accept with revision, countries reporting to FAO are meant to use the same data as they report in inventories which is subject to international review processes, and includes comparisons with independent data sets such as satellites. Will add text re. this. We will discuss the changes in FAO numbers due to alignment.	Jonah Busch	Earth Innovation Institute	United States of America
11285	23	4	23	17	Which definition is used for calculation of CO2 emission figure presented here?? Please explain	Accept with revision. The figure clearly shows the range of different estimates discussed in the text and has been revised. The table and the text state the number is from the GCP reference	Mahmood Riyaz	Maldivian Coral Reef Society	Maldives
27605	23	6	23	6	Reference missing in chapter 7 bibliography: Houghton et al. 2012	Accepted	Dorota Retelska	Independent	Switzerland
27607	23	6	23	6	Reference missing in chapter 7 bibliography: Gasser and Ciais 2013	Accepted	Dorota Retelska	Independent	Switzerland
27609	23	6	23	6	Reference missing in chapter 7 bibliography: Pongratz et al. 2014	Accepted	Dorota Retelska	Independent	Switzerland
27611	23	6	23	7	Reference missing in chapter 7 bibliography: Tubiello et al. 2015	Accepted	Dorota Retelska	Independent	Switzerland
33081	23	6	23	7	Check reference style: (…Smith et al. 2014; Houghton et al. 2012; Gasser and Ciais 2013; Pongratz et al. 2014; Tubiello et al. 2015; Grassi et al. 2018)	Accepted	Mirzokhid Mirshadiev	Wageningen University and Research	Netherlands
27613	23	7	23	7	Reference missing in chapter 7 bibliography: Grassi et al. 2018	Accepted	Dorota Retelska	Independent	Switzerland
27299	23	10	23	10	Livestock grazing should be mentioned here as well	Noted. This will be checked and the text changed accordingly.	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
582	23	10	23	17	Again, as for my earlier comment w/r to remote sensing "evidence" of forest loss, remote sensing sees only decreases in tree canopy cover and only products that span a suficient long time period can detect whether or not this tree canopy recovers from the disturbance. The reference to Hansen 2012 predates the global product by that same group published in Science in 2013, and for which we demonstrated the inability to capture post-disturbance gains in tree canopy in Canada's boreal forests. (see earlier comment for p. 9, l.17-26 , supporting reference: (Guindon et al, 2018 doi:10.1002/ecs2.2094))	Noted & thank you. Consideration will be given to this and the text modified accordingly.	Pierre Bernier	Natural Resources Canada	Canada
32871	23	13	23	17	Good points on the challenges in estimating forest changes, part of this caveat or caution should be included in p13, lines 18 to 30 as that section seems to imply the data are very certain based on limited references.	Noted. This point will be passed to the authors of the relevant section.	Cheah Singfoong	Independent consultant, formerly more than 10 years with the National Renewable Energy Laboratory, USA	United States of America
17265	23	17	23	29	Please add an explanation for "BLUE" to the text. How do you explain / interpret the large difference between official inventories (GHGI) and the models?	Accepted, this was explained in section 7.8, now merged into this section.	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany
12037	23	18	23	19	This figure is very difficult to understand. Please consider either removing it or make it more readable.	Accepted, the figure has been updated and more information added to the figure caption.	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
16907	23	21	23	21	Parts of this figure are confusing. In the top box explaining the line symbols (top of the figure), it is not clear what "BLUE" and "H&N" mean. I suggest changing this to "Bookkeeping model 1 (BLUE)" and "Bookkeeping model 2 (H&N)". Also, in the captions below, it should be "estimates from two bookkeeping models: H&N (Houghton and Nassikas 2017) and BLUE (Hansis et al. 2015)". Also there should be at least a one-line explaination as to why the pink line is so below the other lines. As there is quite a bit of explanations in the text, I suggest adding "Also see text in section 7.3.2.1" to the figure caption.	Accepted, the figure has been updated and more information added to the figure caption.	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
31989	23	21	23	21	legend quotes 'BLUE', pressumably should say 'mean and individual estimates from two bookkeeping models'? It is confusing the BLUE model and blue line. Also, giving colours to identify legend items won't help in black and white printing, can they have different symbols (circle vs cross for example)?	Accepted, the figure has been updated and more information added to the figure caption	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
38931	23	21	23	28	Please check with FAO on the most recent computations in FAOSTAT, including discuss with the data owners what is the proper aggregate of data that should be used in this graph. Additionally, consider using for the FAOSTAT data a more appropriate and recent paper, for instance Tubiello 2019.	Accepted	francesco tubiello	FAO	Italy
6819	23	22	23	23	Are the references placed in a chronological order? If yes, please correct properly	Accepted	Valasia Iakovoglou	International Hellenic University	Greece
22155	23	32	23	34	The sentence from "The DGVMS model.....these runs" need clarification	Accepted	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
20645	23	32	24	1	The inclusion of the "Lost Additional Sink Capacity" of DGVMs is extremely interesting and I commend the authors for metioning it here. However, while this is very useful for determining prospective (future) emissions from different land use strategies, surely it should not be accounted for in historic emission estimates. What "might have been" is not the same as what "was". I feel that the language of this paragraph should make a stronger point about removing this additional 1.5GtCO2/yr.	Accepted	Vassilis Daioglou	Copernicus Institute of Sustainable Development	Netherlands
10431	23	2			what is the trend? It makes only limited sense to declare low confidence in a quantity, even direction of change, that isn't actually stated. It would make more sense to say that "emissions have remained roughly constant (low confidence)" or something like that - and/or provide an upper and lower bound for the trend that you would then have higher confidence in.	Accept with revision, one can have low confidence in the direction of change as well as a specific number, the trends are seen in the figure, but the text has been revised	Andy Reisinger	NZAGRC	New Zealand
21713	23	4		17	what is definition of forest used in this article?sould be explain in Annex	Accept with modification, there is a glossary of terms with each IPCC volume	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
29617	23	6			Gasser and Ciais 2013; Add this article to the reference	Accepted	RAEHYUN KIM	Institute	Republic of Korea
29653	23	6			Houghton et al. 2012; Add this article to the reference	Accepted	RAEHYUN KIM	Institute	Republic of Korea
29745	23	6			Pongratz et al. 2014; Add this article to the reference	Accepted	RAEHYUN KIM	Institute	Republic of Korea
3381	23	9			a tonne of Carbone is better than a Mg C	Accept with revision, text deleted	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
22669	23	11			Tell us what the advancement is.	Noted. Line reference must be wrong	Melissa Lucash	Portland State University	United States of America
29633	23	12			Hansen et al. 2012; Add this article to the reference	Accepted	RAEHYUN KIM	Institute	Republic of Korea
29683	23	12			Kim 2014; Add this article to the reference	Accepted	RAEHYUN KIM	Institute	Republic of Korea
22671	23	16		21	You tell us how the data is collected, but don't relate it to the trends in the figure so it seems out of place here.	Accepted	Melissa Lucash	Portland State University	United States of America

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
3387	23	18		19	the line BLUE has no caption	Noted. BLUE will be defined.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
21715	23	18		29	the title of figure looklike confuse..too long…and source soul be replace	Accepted, figure revised	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
3383	23	21			the unit of the caption in figure 7.11 is in contradiction with the unit shown in ordinate	Accepted, figure revised	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
10433	23	21			Change AFOLU to FOLU - all net CO2 emissions from agriculture are captured by FOLU (or arise from the supply chain outside the AFOLU definitional boundary).	Reject. Trying to avoid use of the term FOLU, which anyway is synonymous with LULUCF. Trying instead to stick to well defined LULUCF. Reordered sections so all CO2 together including cropland and grassland management, and all non-CO2 together including due to land cover change. The FAO numbers here include soil management, some of the DGVMs now also include cropland management.	Andy Reisinger	NZAGRC	New Zealand
3385	23	22			blue lines with a S	Accepted	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
3389	23	32			DGVMs with a small s	Accepted	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
6821	23	32			"DGVMS" to "DGVMs"?	Accepted	Valasia Iakovoglou	International Hellenic University	Greece
43341	24	1	24	1	According to Friedlingstein et al.: Global Carbon Budget 2019, the the loss of additional sink capacity amount to around 0.4 GtCO2/y, not 1.5 as indicated here	Accept with modification. According the latest GCP it is 0.9 GtC and this has been converted to GtCO2	Giacomo Grassi	Joint Research Centre, European Commission	Italy
17267	24	1	24	21	Please keep in mind that FAO data are often out-dated, not necessarily actually measured in a specific country, or represented correctly in models. It would thus be helpful to include a paragraph on the error margin around the estimates from FAOSTAT / FRA.	Noted. The authors thank the reviewer for their suggestion which will be considered.	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany
16919	24	4	24	4	"directly data set directly" > "data set directly"	Accepted	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
33083	24	8	24	9	……Frieldingstein et al, (2019) (see also Pongratz et al, 2014)	Editorial	Mirzokhid Mirshadiev	Wageningen University and Research	Netherlands
27303	24	11	24	11	In Erb et al., 2013 (10.1038/nclimate2004) we have shown that this omission can lead to strongly biased results, in the context of bookkeeping models. In Le Noe et al. 2020 (/10.1111/gcb.15004) these findings are confirmed for the case study of France, where we also find biomass stocks to increase strongly after 1950. This entails that biomass density needed to increase well before (1910 in the Austrian case; see also 10.1007/s10342-019-01241-y), i.e. a time where environmental changes played a minor role. In Le Noe we show that age structure changes drive the system in this period (similar to 10.1073/pnas.1810512116), suggesting that the observed trends are result of a recovery from an initial loss of biomass density that started in the second part of the 19th century. This corroborates the finding that not taking the strong past depletion (degradation, meybe) of forest into account leads to a strong bias, in bookkeeping models as well as in DGVMs with incomplete representation of land manangement.	Noted - thank you. The reviewer's point will be considered and the text changed accordingly.	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
27143	24	11	24	14	None of the paper cited here appear in the reference list	Accepted	Marc Aubinet	University of Liege	Belgium
9883	24	12	24	12	There is no "Valade et al 2017" in the reference list but I think that (Valade et al., 2018) is what you had in mind	Accepted	Valentin Bellassen	INRAE	France
22157	24	12	24	12	"(e.g."...needs more infromation or can it be omitted?	Accepted. This will be changed.	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
27301	24	13	24	14	In Erb et al. (10.1038/nature25138) we show the overall impact of grazing to be of comparable (a bit smaller) magnitude than forest management.	Noted. This will be considered during revision of the passage.	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
12225	24	16	24	21	It is not clear whether the carbon stocks represent biomass or soil or both. For soil stock, there is controversies in using the IPCC default for mineral soils where unit used as %, resulting in huge error in SOC accounting/estimation, instead of by weight. Similar applies to Per Mill concept, and that we need to be cautious in recommending these approaches	Noted. The text will be revised.	Mohammad Ibrahim Khalil	University College Dublin	Ireland

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
38933	24	16	24	21	The description of FAOSTAT data is incorrect as it refers largely to its agriculture emissions domain. Please liaise with relevant FAO staff for the appropriate text/descirption and/or consult the available online metadata at http://fenixservices.fao.org/faostat/static/documents/GL/GL_e_2019.pdf	Noted. Relevant FAO staff have been contacted and the authors appreciate their help.	francesco tubiello	FAO	Italy
43343	24	16	24	21	FAOSTAT includes FRA data on forest (from countries) + emissions from organic soils and burning estimates with Tier 1. This should be made more clear. True that data FAO does not dinguish managed and unamanged, but separates primary (proxy for unmanaged), secondary and planatations	Noted. The text will be modified.	Giacomo Grassi	Joint Research Centre, European Commission	Italy
2911	24	17	24	17	"Tier 1 type approach" to read as "Tier 1 method" (please refer to the tiers definition in the 2006 IPCC Guidelines, Vol.1, Ch.1, p.1.6).	Accepted	Yurii Pyrozhenko	IPCC TFI TSU	Japan
17269	24	18	24	21	FAO data do distinguish forest types, at least by area (see FRA tables 7 - 12, 22, 23).	Noted. This passage will be changed accordingly.	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany
1413	24	31	24	33	Consider also: Liu et al 2015; Grace et al 2014; Pan et al 2011; Busch and Engelmann 2017	Noted. The authors thank the reviewer for the suggested references	Jonah Busch	Earth Innovation Institute	United States of America
12227	24	31	24	38	Further advanatges and disadvantages in use of sattelite/sensor technologies to estimate SOC chnages and even other GHGs are important to include.	Noted & consideration will be given to this. Note that we do not cover other GHGs here, and satellite GHG cannot distinguish anthropogenic	Mohammad Ibrahim Khalil	University College Dublin	Ireland
9805	24	40	24	49	Do which extent ozone depletion is taken into account?	Reject. The models do not include ozone depletion, perhaps the reviewer could suggest some estimates of impact of this on global CO2 plant budget	Jeanne Bormann	Ministry of agriculture	Luxembourg
16921	24	42	24	42	A comma is missing, should be "atmospheric CO2 concentration, nitrogen deposition"	Editorial	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
43345	24	46	24	46	the term "land sink" should be introduced at the beginning of the para	Accepted	Giacomo Grassi	Joint Research Centre, European Commission	Italy
16925	24	51	24	51	Better: "Climate change has mixed effects on vegetation"	Accepted with modification, text deleted, now refers to WGII report	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
6827	24	51	24	53	It needs references	Accepted with modification, text deleted, now refers to WGII report	Valasia Iakovoglou	International Hellenic University	Greece
22279	24	52	24	53	This statement is not completelly true. Photosynthesis might be increased or decreased by increasing CO2, but independently of location or season, but depending of the plant type (C3, C4 or CAM). Overall, C3 plants are loosers,, while C4 are winners under rising atmospheric carbon dioxide (ACD).	Accepted with modification, text deleted, now refers to WGII report	Noureddine Benkeblia	The University of the West Indies	Jamaica
16927	24	53	24	53	The last part of this sentence was confusing. "which may account for at least some of the land sink". Better maybe "which may account for at least some of the additional land sink reported in figure XXX" etc.	Accept with modification, it doesn't account for the land sink seen in the figure as that is generated by the models whereas this is referring to what the models leave out. Text was confusing though and was deleted	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
27305	24	40	25	16	The finding that models only partially reflect managment - entails that the results are biased towards attribution of observed trends to natural drivers instead of land use (see comment above, based on 10.1038/nclimate2004 and le Noe /10.1111/gcb.15004) This relates also to the attribution of the sink to natural drivers (CC, CO2 fertilization, etc.) in the "residual sink" assessment, and land use, is biased. A part of the "landsink" can still be determined by those land-uses and management that are not included in the models. And here, the effect of forest grazing is particularly important, as we show in 10.1038/nature25138 with an other approach, but also Henttonen et al. 10.1007/s10342-019-01241-y show a similar effect.	Noted. This will be taken into consideration. The authors thank the reviewer for the suggested references	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
11287	24	40	25	20	IS this the global same values? Are there differences in the region in Trends in anthropogenic and natural disturbances	Not clear. These are all global values as stated. Not sure what is meant by :the same". The regional trends will eb different for natural and anthropogenic, but since we mostly focus on anthropogenic we did not have space to go into regional natural sinks.	Mahmood Riyaz	Maldivian Coral Reef Society	Maldives
37443	24	40	25	20	It would be very policy-relevant to add information on the current trends in the land sink; this will also determine how big the potential for future mitigation will be. Information on the historical and current trends in the land sink can for example be derived from Section 2.4 of the IPCC SRCCL. In addition, it is worth considering newly released literature such as Hubau et al. (Nature, 2020) who have highlighted that the intact tropical forest carbon sink has already peaked. This may also indicate that the extratropical land sink is underestimated.	Accepted. The trend of the land sink is already discussed. However since this is a natural sink, it is not considered for mitigation but is considered as part of the global carbon budget, referred to WGI for more details.	Michiel Schaeffer	Climate Analytics	Netherlands
32873	24	40	25	30	Would be useful to include data on intermediate and longer term effect of burning, Short term: emission increase. How long to recover? When does it switch from a emission source to sink? How different land covers (forest, savanna) differ?	Reject, this is too much detail for this section. Effect of forest and savanna management is considered under mitigation.	Cheah Singfoong	Independent consultant, formerly more than 10 years with the National Renewable Energy Laboratory, USA	United States of America
27145	24	54	25	3	None of the paper cited here appear in the reference list	Accepted	Marc Aubinet	University of Liege	Belgium
29663	24	2			Hurtt et al. 2019; Add this article to the reference	Accepted	RAEHYUN KIM	Institute	Republic of Korea
29685	24	2			Klein Goldewijk et al, 2017; Add this article to the reference	Accepted	RAEHYUN KIM	Institute	Republic of Korea

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
6823	24	8			"DGVMS" to "DGVMs"?	Accepted	Valasia Iakovoglou	International Hellenic University	Greece
29611	24	8			Frieldingstein et al, 2019; Add this article to the reference	Accepted	RAEHYUN KIM	Institute	Republic of Korea
29939	24	8			Is it need 'see also' before 'Pongratz et al. 2014'?	Accepted	RAEHYUN KIM	Institute	Republic of Korea
29527	24	11			Arneth et al. 2017; Add this article to the reference	Accepted	RAEHYUN KIM	Institute	Republic of Korea
29575	24	11			Erb et al. 2018; Add this article to the reference	Accepted	RAEHYUN KIM	Institute	Republic of Korea
3391	24	12			there is an excess bracket	Accepted	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
29889	24	12			Valade et al. 2017; Add this article to the reference	Accepted	RAEHYUN KIM	Institute	Republic of Korea
29753	24	13			Pugh et al. 2015;Add this article to the reference	Accepted	RAEHYUN KIM	Institute	Republic of Korea
29777	24	13			Sanderman et al. 2017a; Add this article to the reference	Accepted	RAEHYUN KIM	Institute	Republic of Korea
29803	24	17			Tubielo et al, 2013; Add this article to the reference	Accepted	RAEHYUN KIM	Institute	Republic of Korea
29595	24	21			Federici et al, 2015; Add this article to the reference	Accepted	RAEHYUN KIM	Institute	Republic of Korea
29623	24	27			Grassi et al, 2018; Add this article to the reference	Accepted	RAEHYUN KIM	Institute	Republic of Korea
29807	24	32			Tyukavina et al. 2015; Add this article to the reference	Accepted	RAEHYUN KIM	Institute	Republic of Korea
29517	24	33			Achard et al. 2014; Add this article to the reference	Accepted	RAEHYUN KIM	Institute	Republic of Korea
29531	24	33			Baccini et al. 2017; Add this article to the reference	Accepted	RAEHYUN KIM	Institute	Republic of Korea
29637	24	33			Harris et al. 2015; Add this article to the reference	Accepted	RAEHYUN KIM	Institute	Republic of Korea
6825	24	34			" Baccini et al include degradation …" is there a year for this reference?	Accepted	Valasia Iakovoglou	International Hellenic University	Greece
29909	24	48			Zeng et al. 2017; Add this article to the reference	Accepted	RAEHYUN KIM	Institute	Republic of Korea
22673	24	52			Did you mean autotrophic or heterotrophic respiration here?	Accepted with modification, text deleted, now refers to WGII report	Melissa Lucash	Portland State University	United States of America
22675	24	53			References are needed here. You mention temp, but CO2 fertilization and precip are also important obviously.	Accepted with modification, text deleted, now refers to WGII report	Melissa Lucash	Portland State University	United States of America
22677	24	53			Many of those processes ARE included in DGVMs now. You could say some of the process are not always included.	Noted. This will be considered.	Melissa Lucash	Portland State University	United States of America
29521	24	55			Andela et al. 2017; Add this article to the reference	Accepted	RAEHYUN KIM	Institute	Republic of Korea
22159	25	2	25	3	The statement "The reduction ind burning.....recovering forests", mainly recovering forests need much longer time to be a significant sink.	Accepted with modification, text deleted	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
38935	25	2	25	9	Fig 7-12. Please liaise with relevant FAO staff to ensure that the data downloaded from FAOSTAT are in the correct aggregation, to ensure consistency with other data used in the graphs.	Accepted	francesco tubiello	FAO	Italy
38825	25	7	25	9	Even though DGVMs and EaSMs may underestimate the effects of drought, what is the alternative of assessing climate and management effects on the landscape and feedbacks? If anything, looking at the effects of drought with DGVMs and EaSMs provide a better estimate than what is available. I think what would be more helpful would be the range of possibilities from these DGVMs since their representation of dynamic growth processes are different. There are also eco-hydrological/hydro-ecological models that might better assess the relationships between plants and water that may help inform the performance of DGVMs under drought.	Noted: the purpose of this paragraph is not to look for alternatives but to assess the available literature, hence assessing some of the things that may be missed from the models or that they may do poorly. Any estimates included in this section need to estimate the global anthropogenic AFOLU flux. Model benchmarking is the business of the modellers not the IPCC.	Julian Reyes	Personal Capacity	United States of America
43347	25	9	25	9	suggest considering Haverd et al. 2020. Global change biology. Higher than expected CO2 fertilization inferred from leaf to global observations	Accepted	Giacomo Grassi	Joint Research Centre, European Commission	Italy
16923	25	13	25	13	Typo, should be "inversion"	Accepted	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
22161	25	13	25	13	"invernsion" .....inversion?	Accepted	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
31995	25	13	25	13	correct 'invernsion' for inversion	Accepted	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
9807	25	13	25	15	Two typos.	Accepted	Jeanne Bormann	Ministry of agriculture	Luxembourg

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
22163	25	14	25	14	The use of a preposition	Accepted	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
31993	25	14	25	14	correct 'atmosphseric' for atmospheric	Accepted	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
12783	25	18	25	20	There also may be some issues distinguishing anthropogenic and natural disturbances since climate may also drive some of the observed anthropogenic disturbances (as show the link between drought and deofrestation, in Desbureaux et al., 2018: https://www.sciencedirect.com/science/article/pii/S0006320717317111)	Noted. Thank you. This will be taken into consideration.	antoine leblois	INRA	France
17271	25	18	25	20	Please consider revising this paragraph. Droughts do not induce fires, they facilitate them. And since the ignition source of fires is often not known, but a high share is anthropogenic (also in the Amazon), the statement that emissions from anthropogenic deforestation have declined is daring. E.g., Forest clearing by fire can often not be distinguished from a naturally ignited (true) wildfire in remote sensing data.	Accept with modification, text deleted	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany
33129	25	18	25	20	Expand this section i.e. wildfire due to fire also occurred in other tropical mountain forests including in Kenya	Accept with modification, text deleted	George Gatere Ndiritu	University	Kenya
11289	25	22	25	30	Can you include Small islands as a regional group	Reject: Regrettably the 10 regions were agreed by IPCC, not decided by this chapter.	Mahmood Riyaz	Maldivian Coral Reef Society	Maldives
12229	25	28	25	30	In the beginning, various forest types should be clearly defined. In tropical countries, road-side and small-holding plantation of different kinds can be seen, which are substantial and have been increasing through private/public efforts/partnerships.	Reject, this section relies on the definition of forest in each of the different methods assessed for estimating the flux.	Mohammad Ibrahim Khalil	University College Dublin	Ireland
17273	25	28	25	30	Please explain why you consider a gain in forest area only "mainly" to be secondary forests? The area of primary forests cannot increase or do you consider tree encroachment in e.g. tundra, prairie or other formerly treeless areas as "primary forest"?	Reject. The word "mainly" is specifically used so as not to exclude expansion of primary forests. Therefore it does not exclude encroachment	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany
32869	25	28	25	30	Meaing there is no net conversion of forest to agricultural land?	Not clear. This is the meaning implied by using the word NET with gain. In the tropics there is conversion of forest to agriculture and abandonment, but the NET is loss. In non-tropics there is also conversion to agriculture as well as abandonment or planning of forests so there is NET gain.	Cheah Singfoong	Independent consultant, formerly more than 10 years with the National Renewable Energy Laboratory, USA	United States of America
27307	25	30	25	30	The "secondary forests and sustainably managed forest" expression is partly misleading. It meshes "secondary" with "sustainably managed", which is suggests all the returning, secondary forests are managed sustainably. First, "sustainable management" in forestry relates only to the fact that increment is larger than harvest rates, and sustainability is thus very narrowly defined; but sustainability is a much broader concept for the common reader, including much more environmental dimensions e.g. biodiversity, carbon stocks in biomass and soils that are not included in this definition, as well as social and economic dimensions, that are also not part of the definition. Second, harvest rates in many e.g. European countries are currently close to 100% harvest/increment, in some cases (e.g. Sweden) exceeding it, which is hardly reflected in the statement "mainly of secondary forests and sustainably managed forests". Suggestion: delete "sustainably" to avoid misinterpretations.	Accepted	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
38699	25	22	26	9	It the setion is to be mantined it must be explnaded and suppoted by regional estudies as well.	Accepted	Maria Jose Sanz Sanchez	Basque Center for Climate Change	Spain
21717	25	1			Melton, 2018	Editorial	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
29529	25	1			Arora and Melton 2018; Add this article to the reference	Accepted	RAEHYUN KIM	Institute	Republic of Korea
29677	25	2			Kelly et al. 2013; Add this article to the reference	Accepted	RAEHYUN KIM	Institute	Republic of Korea
29895	25	5			Wang et al. 2017d; Add this article to the reference	Accepted	RAEHYUN KIM	Institute	Republic of Korea
14785	25	7			Impact of aerosol induced global cooling reduce the warming potential. (see ref 1. Fagodiya R. K., Pathak H., Kumar A., Bhatia A., Jain N. (2017),Global temperature change potential of nitrogen use in agriculture: A 50-year assessment, Scientific Reports, 7, 44928)	Noted. Thank you for the suggested reference.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
29661	25	8			Humphrey et al. 2018; Add this article to the reference	Accepted	RAEHYUN KIM	Institute	Republic of Korea
29625	25	9			Green et al. 2019; Add this article to the reference	Accepted	RAEHYUN KIM	Institute	Republic of Korea
29687	25	9			Kolus et al. 2019; Add this article to the reference	Accepted	RAEHYUN KIM	Institute	Republic of Korea
17777	25	13		13	"... corroborated by inversion..." no invernsion	Accepted	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
3393	25	13			inversion	Accepted	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
3395	25	14			atmospheric	Accepted	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
3397	25	14			a range	Accepted	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
29561	25	15			Chevallier et al. 2005; Add this article to the reference	Accepted	RAEHYUN KIM	Institute	Republic of Korea
29765	25	15			Rodenbeck, 2005; Add this article to the reference	Accepted	RAEHYUN KIM	Institute	Republic of Korea
29891	25	15			Van Der Laan-Luijkx et al. 2017; Add this article to the reference	Accepted	RAEHYUN KIM	Institute	Republic of Korea
22679	25	18			You could say a lot more on the importance of wildfires on C emissions, esp given the recent fires in Australia, Alaska, etc.	Noted. This will be considered as part of planned revisions.	Melissa Lucash	Portland State University	United States of America
21719	25	26			such as: India, China,	Editorial	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
17275	26	1	26	9	Please revise figure and text. There are two blue lines and two models given, so the panels apparently do not show any mean but the individual estimates of the bookkeeping models. Hansis et al. (2015) have several model runs and method comparisons in their paper - which one is used here? Grassi et al. (2018) is not included in the literature. If you refer to "Grassi et al. 2017 - DOI: 10.1038/nclimate3227", please check whether the emissions taken from (I)NDCs and GHGI in their paper do not include values from accounting (which may be different than values reported under the Convention).	Noted. The figure will be checked and the reviewer's comments will be taken into consideration.	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany
16929	26	2	26	2	Figure 7.12. The North American graph might need more explanations, and maybe a revision. For example, the DGVM mean is not at the midpoint of the two DGVMs (are there more than two used?). Also, the difference between the pink and the green line is very stark.	Noted. This figure will be reviewed. The reviewer's point will be taken into account.	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
38827	26	12	26	16	Have you looked at CAIT data? Emissions for ag and non-ag sectors are available for multiple GHG including CO2, N2O, and CH4 through 2016.	Noted. Thank you for this suggestion. CAIT will be explored.	Julian Reyes	Personal Capacity	United States of America
22165	26	14	26	14	The foot note needs a revision	Accepted. This will be modified with planned revisions to the text.	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
2913	26	19	26	19	Its unclear why NGHGIs "are only available since 1990 in some countries"? As it is known 1990 is the base year for most of the Annex I countries. Consider to modify text.	Noted. The text will be modified.	Yurii Pyrozhenko	IPCC TFI TSU	Japan
20041	26	12	27	6	As a reader I would expect here to find emission estimates - I think the sentences covering comparison and caveats about FAOSTAT, EDGAR, GHGI should be shrotened and even shifted towards the end	Noted. Consideration will be given to this.	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
17735	26	12	27	33	Please consider this comment in revising the section: The energy used by grass-fed cattle derives from CO2 fixation through photosynthesis (renewable energy from the sun). This is not the case for the energy used in meat substitutes as cell- based products where mainly fossil energy (non-renewable) is used. The result is CO2 emissions. CO2 remains in the atmosphere longer than CH4 derived from enteric fermentation (Bonny et al., 2017, Lynch and Pierrhumbert, 2019, and Cain et al 2019). Therefore, both factors have to be taken into account when referring to GHG emissions. References Bonny, P.F., G.E Gardner, D. W Pethick and J.F. Hocquette, 2017. Artificial meat and the future of the meat industry. Animal Production Science https://doi.org/10.1071/AN17307 Cain, M., Lynch, J., Allen, M.R. et al. Improved calculation of warming-equivalent emissions for short-lived climate pollutants. (2019). npj Clim Atmos Sci 2, 29. https://www.nature.com/articles/s41612-019-0086-4 Lynch, J. and R. Pierrhumbert, 2019. Climate impact of cultured meat and beef cattle. Frontiers in sustainable food systems. http://doi:10.3389/fsufs.2019.00005	Noted. The authors thank the reviewer for their suggestion and associated references. Major revisions are planned for this subsection and the reviewer's point will be taken into consideration.	Hsin Huang	International Meat Secretariat	France
9885	26	11	28	4	This section solely relies on FAOSTAT. While FAOSTAT present some clear advantages (global coverage, national and yearly resolution, homogeneous method), it also comes with several pitfalls (perimeter restricted to Agriculture sector as defined in GHG inventories, lack of uncertainty range, lack of LCA-like approach to attribute feed-related emissions to animals). (Rogissart et al., 2019) provides a recent review of estimates of emissions from the food sector which addresses these pitfalls: https://www.i4ce.org/download/estimating-greenhouse-gas-emissions-from-food-consumption-methods-and-results/	Accepted. It is planned, where possible and appropriate, that comparison will be made with EDGAR and recently released EPA data. The authors thank the reviewer for the suggested reference.	Valentin Bellassen	INRAE	France

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
33131	26	10	29	9	More informative and specific to refer to cultivated organic soils (From Figure 7.13 to 715) as cutlivated wetlands as either permanent and seasonal wetlands. Mentioning this in the text will greatly improve this section.	Noted. The authors thank the reviewer for their suggestion. The inclusion of more information on cultivation of organic soils in this section will be considered. There may be an issue with classification of emissions, but this will be investigated.	George Gatere Ndiritu	University	Kenya
21721	26	1		9	need more re format and rewrite the sentenses	Noted. The figure caption will be reviewed and revised as deemed appropriate.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
10435	26	11			I'm missing from this section an assessment/critique of Tier 1 inventory approaches to derive time series over extended time periods in agriculture. There is enough literature for IPCC to make a meaningful statement about the utility, and limits to utility, of Tier 1 approaches. Also I'm looking for a more critical evaluation of different databases rather than wholesale reliance on FAOSTAT (especially given that EDGAR will become the recommended emissions database to be used for comparability across the different WGIII chapters). For projections, authors should compare and constrast FAOSTAT with emissions in the different SSPs, but also other projections of agriculture emissions by other relevant organisations. Can this assessment provide a more robust range of emissions in 2030 and 2050? This would be enormously helpful, including what assumptions drive outcomes within that range (population, diets, technological progress). This would be highly policy relevant but seems missing for now.	Accepted. Consideration will be given to the inclusion of discussion on Tier 1 approaches. A new subsection on the topic will be considered. A more critical examination of databases will be presented, that will include the latest US EPA inventory. Regarding projections, it is planned that FAO projections will be compared with those of the US EPA for 2030 and 2050. Discussion will hopefully also be included on the assumptions behind these projections.	Andy Reisinger	NZAGRC	New Zealand
3399	26	14			(Refs) for EDGAR	Noted. Proper reference will be provided.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
29941	26	14			Please add specific refereces.	Noted. Proper citation will be provided	RAEHYUN KIM	Institute	Republic of Korea
9809	27	2	27	2	Typo 'manure appilied'	Accepted. The sentence will be modified.	Jeanne Bormann	Ministry of agriculture	Luxembourg
22167	27	2	27	2	Misspelling on "appilied"	Accepted. The spelling will be corrected.	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
14787	27	2	27	3	crop residue burning, biomass burning (includes forest fire, savannna burning etc)	Noted. The text will be changed.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
12059	27	3	27	3	Please include "Manure managment" after "Enteric fermentation" in this sentence	Accepted. The sentence will be changed.	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
29173	27	6	27	6	CO2e	Noted. This will be revised	SMAIL KHENNAS	Energy and Climate Change Consultant	United Kingdom (of Great Britain and Northern Ireland)
16931	27	8	27	8	Is this figure for CO2 or non-CO2 emissions? The text says that its for CO2. I think the figure should include CO2 and non-CO2 emissions (as CO2e).	Noted. The figure referred to CO2 & non-CO2 emissions, but will be revised.	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
38937	27	8	27	11	The reference to FAOSTAT in Fig 7-13 should either be FAOSTAT (2019) or a published paper. In such cases better to use one more recent than 2013, for instance Tubiello 2019. Furthermore, FAO will come out with emissions updates in a few months (Jul 2020) and an analytical brief that could be used to complement the analysis made by the authors herein. The authors could usefully interact with relevant FAO staff to ensure their analysis is consistent with FAO's own based on the same data.	Noted. More recent data will be used, while relevant FAO staff have been contacted.	francesco tubiello	FAO	Italy
8563	27	12	27	12	Figure 7.13 shows agricultural non-CO2 emissions between 1970 and 2017 , while data source is FAOSTAT(2013). You have to check the publication year.	Accepted. The figure will be updated with relevant citation	Eun Jung Choi	National institute of agricultural sciences	Republic of Korea
46189	27	14	27	14	Gt CO2 e yr-1 or Gt CO2 eq yr-1 as in previous sections?	Noted. All units will be checked and converted to CO2eq were appropriate.	Daniel Ortiz-Gonzalo	Department of Geosciences and Natural Resource Management, Faculty of Science, University of Copenhagen	Denmark
29943	27	14	27	18	It is not clear that the amount of non-CO2 emission is accumulated values or annual values. The unit differe compare with Figure 7.13. Please check the values and/or unit.	Accepted. The figures will be revised and the units checked.	RAEHYUN KIM	Institute	Republic of Korea
22281	27	14	27	21	It should be pertinent to highligh the contribution of livestocks to CH4 emission which avetage more than 40%.	Noted. The contribution of livestock to CH4 emissions will be outlined.	Noureddine Benkeblia	The University of the West Indies	Jamaica
17873	27	14	27	33	Feed production and processing, and enteric fermentation from ruminants, are the two main sources of emissions, representing 45 and 39 percent of sector emissions, respectively. Manure storage and processing represent 10 percent, with the remaining 6 percent attributed to the processing and transportation of animal products. These emissions could be reduced by between 18 and 30 percent if producers in a given system, region and climate adopted the practices currently applied by the 10 to 25 percent of producers with the lowest emissions intensity in the system considered (FAO, 2013a).	Noted. Additional discussion on the sources of emissions will be included and hopefully satisfy this comment.	Hsin Huang	International Meat Secretariat	France

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
31997	27	16	27	16	was enteric methane 2.43 GtCO2e (43%) ' needs a grammar revision, maybe add 'methane at 2.42…'	Accepted. This sentence will be changed as part of planned wider revisions	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
31999	27	19	27	19	CORRECT: 'Emissons ' for Emissions	Accepted. The sentence will be changed during revisions.	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
16933	27	20	27	20	Should be "synthetic nitrogen(N) fertiliser"	Accepted. Reference to 'N' fertilisers will be revised.	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
29171	27	23	27	31	In some instances figures are in Gt and in other instances in Tg. Tera might be convvenient to avoid long number, however comparision is not immediate for the average reader	Noted. All figures and values will be revised.	SMAIL KHENNAS	Energy and Climate Change Consultant	United Kingdom (of Great Britain and Northern Ireland)
32001	27	28	27	29	space needed in: 109 Tgyr-1 to Tg yr-1 check further down for same revision	Noted. This will be changed as part of planned wider revisions.	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
12231	27	28	27	33	The term 'manure' should be used carefully as there is clear differentiation amont deposition, application anad management and accrodingly various terms are being used. These should be clearly indicated here and throughout so as to avoid confusion in the use of various terms. Manure management in general a sub-category and that need to be redefined.	Accepted. Clarification of what 'manure' refers will be provided.	Mohammad Ibrahim Khalil	University College Dublin	Ireland
16935	27	28	27	33	I think it is better to use the units of megatons (Mt) for methane and N2O, as it is consistent with the rest of this chapter.	Noted. The use of metrics will be discussed and revised accordingly.	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
27309	27	7	29	4	Figures 7.13, 7.14, 7.15: would be important to add uncertainty bars (or any other form to display information on uncertainty), as the various data sources and approaches yield quite different results, in particular at the world-regional level. There are also some alternative assessments, e.g. 10.1111/gcb.13709, 10.1016/j.gloenvcha.2019.102029 gives an overview on N fluxes, etc.	Accepted. The inclusion of uncertainty / error will be considered.	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
14789	27		29		legend crop residue implies to ???? (incorporation into soil) fig 7.13, 7.14	Noted. Clarification on what crop residues refers will be provided.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
17779	27	2		2	"... Manure applied to soils" no applilied	Noted. This misspelling will be corrected as part of more general re-writing.	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
17781	27	8		8	use CO2eq as in the representation no CO2e (be coherent with the units representation). Valid for later on.	Accepted. The use of units will be revised.	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
21723	27	8		12	need more re format and rewrite the sentenses	Noted. The figure and associated caption will be revised.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
3401	27	23			provides	Accepted. This sentence will be changed as part of wider revisions	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
29945	27	24			It is not clear that the amount of non-CO2 emission is accumulated values or annual values. Please check the unit.	Accepted. The figures will be revised and units checked. The values currently refer to average annual emissions for time period specified.	RAEHYUN KIM	Institute	Republic of Korea
20161	27	28		33	either use the SI unit (Tg/yr) or the more common convention (Gt/yr), but please do not mix. Also use only CO2e (and convert other units, if necessary)	Accepted. The use of units and metrics will be reviewed	Henry Neufeldt	UNEP DTU Partnership	Denmark
3403	27	28			109 Tg …space… yr-1	Accepted. This sentence will be changed as part of planned wider revisions, while the use of units will be checked.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
28995	28	1	28	1	Figure 7.14, in the last column the header is "2010-17" is that emission from 2010-2017 or average per year? Please make it clear	Accepted. This figure will be revised. The values currently refer to the mean annual value for each decade, or for the specified time period.	Marissa Malahayati	National Institute for Environmental Studies	Japan
32003	28	2	28	2	Add in figure legend these are global estimates	Accepted. The figures will be revised.	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
38939	28	2	28	3	Same comment as above in terms of better liaising with FAO staff who is available to help in data analysis /provisin of most recent/ data	Accepted. Contact has been made with FOA staff, and their help in due course would be greatly appreciated.	francesco tubiello	FAO	Italy
32005	28	5	28	5	correct: 'agricutlural ' for agricultural	Accepted. This will be corrected as part of planned wider revisions.	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
44165	28	5	28	5	If this is a subtopic title,please be consistent and make it bold.	Accepted. The use of this title in general will be revised.	Tshepiso Mafole	University of Cape Town	South Africa

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
26861	28	6	28	10	It is nice to see the regional analysis, but it would be good to explain the differences between regions in more detail. Increases in animal production in Asia is more associated with monogastrics than ruminants and emissions are from manure management. In Latin America, enteric fermentation emissions continue to rise. It would be good to exlain how the different sources vary across regions. Also, it would be good to put emissions on a per capita basis to show emissions intensity of the food systems. We don't want to be blaming developing countries, they simply have more people and the opportunities for efficiency gains are perhaps elsewhere. Also developed countries are outsourcing a lot of meat production, can we get some estimates of emissions embodied in trade of agricultural commodoties?	Accepted. It is planned that this information will be contained in the revised Section 7.3 (Drivers) and will also be outlined at the end of this subsection.	Louis Verchot	International Center for Tropical Agriculture	Colombia
9811	28	7	28	7	Should it not say "developing countries" instead of "developed countries" in the following sentence: "Developed countries contributed 20% with ..."	Noted. The sentence purposely referred to 'Developed countries' in accordance with the IPCC 5 regions classification.	Jeanne Bormann	Ministry of agriculture	Luxembourg
11291	28	12	28	17	What may be the reason for this? Anything related with climate change?	Noted. Discussion on driver's will be presented in Section 7.3, but brief reference will be made here.	Mahmood Riyaz	Maldivian Coral Reef Society	Maldives
26863	28	12	28	17	N2O emissions are still highest in the mid-west US, W. Europe, India and China. Changes in other regions are from a low baseline and emissions are still low.	Noted. It is planned that this subsection will be extensively revised, and consideration will be given to including this point.	Louis Verchot	International Center for Tropical Agriculture	Colombia
5073	28	14	28	14	deline .... Decline	Accepted. The misspelling will be rectified as part of planned general revisions	Sayed Masoud Mostafavi Darani	Iran Meteorological Organization	Iran
5075	28	14	28	14	CO2e.....CO2	Noted. CO2eq was meant in this sentence, though will likely be changed as past of more general planned revisions.	Sayed Masoud Mostafavi Darani	Iran Meteorological Organization	Iran
9813	28	15	28	15	"the other three regions": rather list the regions, as it is is not so obvious which regions are targeted here	Accepted. The sentence will be revised.	Jeanne Bormann	Ministry of agriculture	Luxembourg
22169	28	5	29	9	Either increases or decreases in agricultural Non-CO2 emissions depend on agricultural practices applied by farmers.	Noted. The authors hope that planned general revisions to the subsection will address the reviewer's comment.	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
3405	28	5			agricultural	Accepted. This spelling will be corrected.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
6829	28	5			Please check the format "Regional trends in agricutlural Non-CO2 emissions"	Accepted. The format and use of subheadings will be revised.	Valasia Iakovoglou	International Hellenic University	Greece
21725	28	5			Regional trends in agricutlural Non-CO2 emissions ???title???	Noted. The format of subheadings and the specific misspelling within the mentioned heading will be addressed.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
17783	28	6		15	same as above CO2eq	Noted. The use of units and metrics will be revised.	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
17785	28	14		14	"... Overall decline" no deline	Accepted. This misspelling will be addressed as part of planned wider revisions.	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
3407	28	14			decline	Noted. This misspelling will be corrected as part of more general planned revisions.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
20163	28				What's the reason organic soils and savanna burning are not included prior to 1990?	Noted. Source classifications differed prior to 1990 and so organic soils and savanna burning are not specifically outlined for the concerned decades. In any case, this figure will be updated and revised.	Henry Neufeldt	UNEP DTU Partnership	Denmark
16635	29	1	29	1	virtually all of this section is on forestry - anything to say on ag? There have been some programs but most have not addressed additionality. Also It would be good to acknowledge limited time of accumulation - saturation or new equilibrium.	Noted. The subsection will be extensively revised, with hopefully more emphasis on Ag.	Bruce McCarl	Texas A & M University	United States of America
38941	29	2	29	4	Same as above.	Noted. Contact has been made with relevant FAO staff.	francesco tubiello	FAO	Italy
28081	29	3	29	3	Improve the quality of the figure	Accepted. The figure will be revised.	Alix Frank Rodrigue Idohou	National University of Agriculture	Benin
46511	29	3	29	3	Why is this figure only up to 2013? Is there no more recent data?	Noted. The figure will be updated, using more recent data and the associated source referenced.	Rachel Bezner Kerr	Cornell University	United States of America
27147	29	6	29	6	I fully agree !	Noted. Regional differences in emissions per unit of product and per capita will be considered, with additional discussion likely to be provided in the new Section 7.3 (Drivers).	Marc Aubinet	University of Liege	Belgium

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
240	29	6	29	9	this paragraph seems to be comment for a section to complete. I concur with the comment	Noted. Consideration will be given to the inclusion of discussion on regional emissions per unit of product and per capita.	Diego Morgavi	INRAE	France
9815	29	6	29	9	"Free-floating comment" still present in the text.	Noted. The mentioned subsection will be expanded.	Jeanne Bormann	Ministry of agriculture	Luxembourg
9887	29	6	29	9	There are actually several sources for such information. I'm actually planning a review of these, although not all have provided open access to the detailed data. The only one that provides easy access to detailed data and that would therefore fit your purpose is (Kim et al., 2019).	Noted. The authors thank the reviewer for the suggested reference. The subsection in question will be written.	Valentin Bellassen	INRAE	France
10437	29	6	29	9	Per definition it would be wrong to derive an emissions intensity figure from a Tier 1 database time series, because the Tier 1 approach by definition assumes no change in emissions per animal or per ha of cropland. I agree that such a section would be important but a more nuanced discussion is needed - and it would be very helpful for IPCC to clarify the limitations of using Tier 1 emission databases and inventories for emissions intensity. GLEAM and related studies and approaches would need to be used for this (but could be compared and contrasted with results that one would obtain from an uncritical use of a Tier 1 approach for emissions intensity).	Accepted. Consideration will be given to the inclusion of discussion on Tier 1 approaches and associated limitations. It is planned that specific limitations concerning calculation of emissions per unit of product or per capita will be mentioned here with emphasis on LCA approach values.	Andy Reisinger	NZAGRC	New Zealand
12233	29	6	29	9	For proper accounting, upscaling and mitigation, the section mentioned here should also consider to provide informaton on emissions per unit/parcel basis.	Noted. It is hoped that planned revisions will satisfy the reviewers comment.	Mohammad Ibrahim Khalil	University College Dublin	Ireland
14791	29	6	29	9	emissions/capita should be be given from data with regional populations and similarly emission per unit product can be given from data on regional products/ or may GDP.	Noted. However, due to limitations from using Tier 1 inventory accounting, simple determination of emissions per unit of product or per capita may not be accurate and not provide reliable information. Nonetheless, consideration will be given.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
32007	29	6	29	9	I guess the following is a note for authors (and also sub section 7.3.2.5): Need a section on emissons per unit of product and emissions per capita – unlikely that we can get emissions per unit of product on a regional basis but we can get a global picture from FAO (update graph in AR5) plus we can simply use the FAOSTAT emissions data with regional populations to derive a per capita figure for each region over time	Noted. The mentioned subsection will be written	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
30537	29	12	29	12	There was no text to review here, which means that the basis for the dismissive statement about biophysical effects in the Exec Summary (page 3 lines 20-21) cannot be checked. The placeholder for 7.3.2.5 points to SRCCL and WG1, but these do not back up the statement made in the Exec Summary.In any case, this section needs more than a mere summary of the SRCCL and WG1 discussions, since neither of these are specifically addressing the issue of mitigation. This WG3 chapter need to properly address the implications of short-lived climate forcers and biophysical effects of AFOLU for mitigation	accept, we will have a elaborated section on biophysics, VOs etc. By sebastiaan	Richard Betts	Met Office Hadley Centre	United Kingdom (of Great Britain and Northern Ireland)
38701	29		29		Figure 7.14 and 7.15: harmonize the leyends of colors for the regions. And make the numbers bigger in the tables under	Noted. The figures will be revised	Maria Jose Sanz Sanchez	Basque Center for Climate Change	Spain
27313	29	15	31	46	This passage could profit from a more explicit use of uncertainty language in the next round of revisions	Agreed. Will be addressed in revision	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
20245	29		39		There is only one sub-section 7.4.1. Historical trends under Section 7.4 and hence should it be another sub-section under 7.4?	Agreed. Will be addressed in revision	Thi Lan Huong Huynh	Viet Nam Institute of Meteorology, Hydrology and Climate change	Vietnam
16585	29	1	#REF!	####	virtually all of this section is on forestry - anything to say on ag? There have been some programs but most have not addressed additionality. Also It would be good to acknowledge limited time of accumulation - saturation or new equilibrium.	Noted. It is hoped that this comment will be dealt with under Comment ID. 116635.	Bruce McCarl	Texas A & M University	United States of America
17787	29	3		4	to better say ... "Top: total CO2eq emissions"...	Noted. The figures will be revised	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
3409	29	6		12	this section is missing	Noted. The mentioned subsection will be properly written.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
10439	29	11			Unclear what the purpose of this section is. Please ensure the cross-chapter box on GHG metrics is used and referenced here (I'd suggest drawing only very brief conclusions based on the box); if the purpose is to discuss policy initiatives for SLCF (such as CCAC) then I feel this is the wrong place here and it belongs more in either the next section, or the as yet missing section that looks forward to policy options to support implementation of mitigation options.	accept, we will have a elaborated section on biophysics, VOs etc.	Andy Reisinger	NZAGRC	New Zealand

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
43295	29	11			this section is supposed to provide a summary/update of the biophysical effects of land; hard to comment without seeing it. My colleagues and I have just submitted a paper that has two useful summary-type figures that highlight the regional differences in biophysical effects of forest on climate. One figure shows the latitude of net-zero effect: the latitude at which forests switch from locally cooling to locally warming (across more than a dozen studies). The second figure shows the relative size of carbon dioxide effects versus biophysical effects of forest at different latitudes on global temperature--it is the first analysis to show a detailed spatial breakdown comparing carbon to non-carbon effects of forests on climate. I would like to see this chapter consider the idea that there is another way that the land sector can mitigate climate change: through direct physical effects of forests. Just as we consider solar radiation management through technical means, we should address the 'solar radiation management' delivered by forests at different latitudes. Happy to provide an advance copy of the manuscript while it is in review.	accept, we will have a elaborated section on biophysics, VOs etc.	Deborah Lawrence	University of Virginia	United States of America
5915	29	12			Given a chapter LA and CA are from the NZAGRC, there should be good opportunity to include a useful assessment of this somewhat controversial debate - but of course, it also needs to link with WG1 findings. Is there a formal link between authors of this chapter and WG1?	accept, we will have a elaborated section on biophysics, VOs etc.	Ralph Sims	Massey University	New Zealand
10441	29	15			This is a potentially very important section, but it falls short on assessing the policy landscape and the drivers, barriers and enabling factors in action so far. It also is more of literature review than an assessment (where are the policy-relevant conclusions from this section?) Key questions I would expect this section to answer is how widespread is policy in AFOLU (and separately, for A and for FOLU)? What types of policies have been implemented (on a regional basis)? How much of the economic mitigation potential have those policies realised, how big is the gap? What do we know about the barriers to implementing more stringent policies, what have been success factors?	Good point. Will improve discussion and do a better job of linking barriers and enablers to the policies discussed. The point about how much has been realized and how much is the gap is one of the outcomes we are hoping to achieve, so we'll improve the writing to try to make this more clear.	Andy Reisinger	NZAGRC	New Zealand
10447	29	15			With regard to the attribution of the success of policies (table 7.3) I'm very concerned that the authors confuse correlation with attribution. For example, I'm not aware of any work that clearly ATTRIBUTES the AFOLU outcomes in NZ to the existence of the ETS, since changes in commodity prices and profitability of alternative land-uses, plus existing land-use regulations and tenure structures will all have influenced outcomes. If the goal of the authors is to make a statement that attributes emissions outcomes to climate policies they need to be sure to have demonstrated how much of the outcome is due to climate policy. Or, if the literature does not allow this, they need to scale back their ambition and their statement to what the literature does allow them to say.	Interesting point. The table provides estimates from a range of sources, including official national inventories, or national reports to the UNFCCC. The methods and approaches when reported in such a way use IPCC Good Practice Guidance. Many of the studies described in table 7.2 provide the kind of impact, or attribution, analysis you request. The NZ estimates are emission offsets by the forestry sector established by law. They indeed may not be additional, a point that we will note in the additionality section.	Andy Reisinger	NZAGRC	New Zealand
19803	30	1	30	10	Text and table give disparate examples on policies to reduce emissions. It doesn#t become clear if this is meant taxatively (for policies) or gives only some examples; the same is true for the spatial reference: f.e. land use regulations to prevent conversion of forest land are part of most forest acts in Central Europe (eg Austrian Forest Act 1975). FLEGT ommitted, PEFC certification ommitted.	Agreed. Will revise the table and text in SOD.	Michael Englisch	Austrian Research Centre for Forests	Austria
20043	30	2	30	2	As the chapter is about CO2 and non-Cos, it would be good to start with a more general sentence, not only a focus on carbon storage	Agreed.	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
588	30	2	30	7	Please reconcile the "have been applied" on line 4 with the "could be used" on line 7	agreed.	Pierre Bernier	Natural Resources Canada	Canada
2941	30	7	30	7	Table 7.2 Policies that could be used to reduce emissions or increase carbon stored on the landscape. Need more examples from Asia and perticularly from South Asian countries; many countries in South Asia are highly vulner able to changing climatic conditions	Thanks. Will revise table and text in SOD	Adnan Arshad	China Agricultural University	China
28293	30	7	30	7	Policy: Certification, Example: Coffee supply chain, Region: Colombia, Scale: State-wide, Effect on carbon: Reduced deforestation, Citation: Rueda and Lambin 2013	Thanks. Will revise table and text in SOD	Mallika Sardeshpande	Rhodes University	South Africa
28295	30	7	30	7	Policy: Finance, Example: REDD+ payments for forest conservation, Region: Brazilian Amazon, Scale: Region-wide, Effect on carbon: No change in deforestation, Citation: Bauch et al. 2014	Thanks. Will revise table and text in SOD	Mallika Sardeshpande	Rhodes University	South Africa
28297	30	7	30	7	Policy: Finance, Example: REDD+ payments for forest conservation, Region: Madagascar, Scale: Nation-wide, Effect on carbon: No change in deforestation, Citation: Rasolofoson et al. 2015	Thanks. Will revise table and text in SOD	Mallika Sardeshpande	Rhodes University	South Africa
28787	30	7	30	7	Are there any policies in the Middle East coutries? Is there any information? Table 7-2	Thanks. Will revise table and text in SOD	Alireza Yazdani	Shiraz University	Iran
39261	30	7	30	7	Line 12 - Forest code also increases carbon in forests, because besides reducing deforestation it aims to reforest deforested areas	Thanks. Will revise table and text in SOD	Roberta Zecchini Cantinho	UNDP / UnB	Brazil
44167	30	7	30	7	Are there any policies made in the African continent? Maybe you could also include why some countries fail to adhere or do not have such policies as a strategy to strengthen mitigation world-wide.	Thanks. Will revise table and text in SOD	Tshepiso Mafole	University of Cape Town	South Africa
45083	30	7	30	7	Examples that are given in the top 2 rows on "Land Use Planning" may be increased as relevant.	Thanks. Will revise table and text in SOD	Siir Kilkis	The Scientific and Technological Research Council of Turkey	Turkey
11293	30	7	30	8	Examples from Asia Europe and africa is not included in the table? How representative is this table?	Thanks. Will revise table and text in SOD	Mahmood Riyaz	Maldivian Coral Reef Society	Maldives
17277	30	7	30	8	Since the table includes examples that have had no effect or showed leakage, consider changing "could be used" in the table name to "have been tried". Please do not delete the examples which had limited or no success	Thanks. Will revise table and text in SOD	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
18149	30	7	30	8	I assume that the regions specified in the third column are those investigated in the studies cited in the last column. However, for an assessment it would be a lot more useful to structure such a table in a manner that summarizes insights from various studies related to different policies and explains their wider applicability. For a review article, structuring a table like that may be acceptable, but in an assessment report I expect to be told what the entire literature out there is able to tell me on a specific policy, and not what one (perhaps arbitrarily chosen) study says about one specific region like the State of Oregon, USA	Good point, but the policy examples are meant as examples of successful policies.	Helmut Haberl	Institute of Social Ecology, University of Natural Resources and Life Sciences, Vienna	Austria
19695	30	7	30	8	Progressive policies may include one that promotes forest moratorium and in combination with livelihood support - and further augmented by increasing farm-gate prices of forest and agroforestry products in order to ramp up the local communities' benefits (from conservation)	Thanks. Will revise table and text in SOD	Mochamad Indrawan	Research Center for Climate Change - Universitas Indonesia (RCCC-UI)	Indonesia
19697	30	7	30	8	ref: Suwarno, A., van Noordwijk, M., Weikard, H. et al. Indonesia's forest conversion moratorium assessed with an agent-based model of Land-Use Change and Ecosystem Services (LUCES). Mitig Adapt Strateg Glob Change 23, 211–229 (2018). https://doi.org/10.1007/s11027-016-9721-0	Thanks. Will revise table and text in SOD	Mochamad Indrawan	Research Center for Climate Change - Universitas Indonesia (RCCC-UI)	Indonesia
29175	30	7	30	8	There isn't a single example from Africa.I do believe that community forest management has been developed in several Sub-Saharan countries	Thanks. Will revise table and text in SOD	SMAIL KHENNAS	Energy and Climate Change Consultant	United Kingdom (of Great Britain and Northern Ireland)
32875	30	7	30	8	If there was any cost data or cost-effectiveness data for the policies listed, that could potentially be very useful (of course if the cost is challenging to compare from one project to the other then listing them may distort the picture)	Thanks. Will revise table and text in SOD	Cheah Singfoong	Independent consultant, formerly more than 10 years with the National Renewable Energy Laboratory, USA	United States of America
38627	30	7	30	8	It is agreeable to provide good examples of policies in this report. However, the current table 7-2 is too pick-up choose of the example. For instance, deforestation in Amazon region is still on-going and rather accelerating under the current Brazilian Government, thus it is not easily understood regulation of "Prohibit the conversion of land to soy production" is really working in reality. In addition, I expect a lot of suggestions to insert national policies are coming from governments during the government reviews. Possibly, providing examples here can be done without table.	Thanks. Will revise table and text in SOD	Atsushi Sato	Mitsubishi UFJ Research and Consulting Co.,Ltd.	Japan
43051	30	7	30	8	The table presented here is quite useful, however the tags used in the policy column are slightly vague. A way to make the information richer would be to highlight in some way (maybe colour coding?) they type of policy instrument in each case using the taxonomy presented in Chapter 13 (policies). Eg. Forest certification could be classified as an "information program". This taxonomy is more general, and hence it would be accessible for readers with other sectoral backgrounds	Thanks. Will revise table and text in SOD	Parth Bhatia	Centre for Policy Research, New Delhi	India
43053	30	7	30	8	Consider expanding the table to include examples of other policy types such as voluntary supply chain management, voluntary markets, agricultural offsets etc.	Thanks. Will revise table and text in SOD	Parth Bhatia	Centre for Policy Research, New Delhi	India
46233	30	7	30	10	Historical trends. Table 7.2: Canada and Australia have also used protected areas without leakage for reducing emissions. In the case of Australia removing significant areas of primary and other high conservation value forest from wood production resulted in net zero carbon accounts for the state of Tasmania in 2017 - somewhat ironic given that Austrtalia has refused to allow either an avoided harvest or avoided deforestation method into its Emissions Reduction Scheme and tragic given that Australia has one of the highest deforestation rates in the developed world and is the only developed country to make it onto WWF's global list of deforestation hotspot (2018).	Thanks. Will revise table and text in SOD	Virginia Young	Australian Rainforest Conservation Society, Griffith University, CAN Ecosystems	Australia
242	30	9	30	10	sentence not clear. Need to be linked to previous or following sentence	Thanks will edit.	Diego Morgavi	INRAE	France
12235	30		30		Table 7.2. To better understand, further clarfications/wordings/keypoints are required under 'Example' column.	Thanks. Will revise table and text in SOD	Mohammad Ibrahim Khalil	University College Dublin	Ireland
38703	30		30		Table 7.2: suggesto to change to "Policies used...". That policis were used in the past do not mean should be used in the future. Euopenan policies are missing, what about some of the componenes of the Comon Agruiculture Policy of the EU. Or even some policies or programs in specific EU countries?	Thanks. Will revise table and text in SOD	Maria Jose Sanz Sanchez	Basque Center for Climate Change	Spain
18151	30	1	31	46	Under a heading "historical trends" I would not suspect to see a discussion of past policies. Not sure what the intended contents of this should have been, and whether the headline needs to be altered, or a different section needs to be written (or both, to a certain degree)	Thanks. Will revise table and text in SOD	Helmut Haberl	Institute of Social Ecology, University of Natural Resources and Life Sciences, Vienna	Austria
17123	30	2	31	11	An example of applied policy is the new law of the province of Córdoba Argentina on afforestation in agricultural sectors (law 10467 of the constitution of the province of Córdoba). It establishes that farms and agricultural establishments must possess 2% of their forested area with certain types of trees, having a period of 5 years to carry out this initiative, otherwise they would incur serious fines. This initiative could contribute to a small mitigation of the AFOLU sector as a CO2 sink	Thanks. Will revise table and text in SOD	Fernando Forgioni	Universidad Nacional de Villa María	Argentina
25763	30	7	31	0	Table 7.2: Wording of effects on carbon seem inconsistent: why does prevention of standing forest conversion (row 1) result in 'increased carbon' whilst protected areas (row 8) results in 'reduced deforestation'? Suggest added detail to ensure that differences and similarities are really clear (e.g. also make sure that risk/potential spillovers/leakage are highlighted in every relevant example)	Thanks. Will clarify. To the specific points raised, note that conversion to development may not lead to land clearing, and some developed plots may have considerable carbon remaining.	Helen Hughes	University of Edinburgh	United Kingdom (of Great Britain and Northern Ireland)
38705	30	1	32	3	The section has a biass towards carbon markets, Performace base payments and PES. What about other schemes? (subsidies, taxes, etc.)	good point. Some are discussed on 7.7. revision combines 7.4 and 7.7 and addresses this point.	Maria Jose Sanz Sanchez	Basque Center for Climate Change	Spain

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
38629	30	1	33	34	This section too much focus on trading or market mechanism. If this is a sub-section to provide a history or result of market in the AFOLU sector, current formulation could work. However, based on the name of heading, this section seems the general section to provide a history of a policy and so the current information is too narrow to talk. When we talk the history of this section, the biggest topic must be KP-LULUCF for Annex I parties for both CP1 and CP2. Then, topic can go to sink-CDM, REDD+ and voluntary market after that.	Good point. Agreed. Revision improves and combines 7.4 and 7.7 to address this point.	Atsushi Sato	Mitsubishi UFJ Research and Consulting Co.,Ltd.	Japan
26865	30	1	39	33	This section does not really assess the literature, it is a literature review. There is no uncertainty langauge throughout.	Will address uncertainty in SOD	Louis Verchot	International Center for Tropical Agriculture	Colombia
46873	30	14	39	32	This chapter is almost exclusively about forest activities, mainly REDD+. It neglects achievements and lessons learned from agricultural measures. You may either include further examples or clear highlight the focus of this chapter in the title and introduction.	Agreed. Will include broader representation of agriculture in SOD	Martin Schönhart	University of Natural Resources and Life Sciences, Vienna	Austria
20165	30	2		5	What about all the policies and measures more often designed to do something else that have CDR outcomes (eg forest protection, watershed management, peat regeneration, etc)	Good point. Will discuss in revised policy section of report.	Henry Neufeldt	UNEP DTU Partnership	Denmark
1415	30	7			Table 7.2 - it is unclear what criteria were used for including studies in this table. They omit several important policies, including but not limited to recognition of Indigenous land rights (e.g. Blackman PNAS 2017); ecological fiscal transfers (e.g. Busch and Mukherjee 2017), moratoria on extractive concessions (Busch et al PNAS 2012). Meanwhile those that are included seem to be selective and not representative or synthetic of overall effects found throughout the literature. See eg Busch and Ferretti-Gallon 2017, as well as the other previous review studies cited in that work (Angelsen and Kaimowitz 1999; Geist and Lambin 2002; Chomitz 2007; Rudel et al. 2009; Angelsen and Rudel 2013; Pfaff, Amacher, and Sills 2013)	table meant to be representative not inclusive. Will include many of these citations in the text in the policy section that now includes the combined sections 7.4 and 7.7	Jonah Busch	Earth Innovation Institute	United States of America
10443	30	7			Table 7.2: there is a striking absence of any reference to the NZ ETS, and the Australian ERF. Also policies in California and Alberta providing for agriculture reductions to be used as offsets within fossil-fuel focused ETS. The latter is mentioned in the text but it should be in the table otherwise the table provides a very skewed picture.	Table will be clarified. Trading schemes are broader than land use. Will include "offsets" explicitly in the table as these are the relevant components of trading systems for land use policy.	Andy Reisinger	NZAGRC	New Zealand
21727	30	7			The policy of the Ministry of Environment and Forestry of Indonesia in 2019, no longer can be opened up or exploitation of peatlands for the development of forestry and plantation businesses.	Thanks. Will consider for inclusion.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21729	30	7			in Indonesia not only in Sumatera but also in others province, so need more literature abaout it	Thanks. Will consider for inclusion.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
46871	30	7			I'm aware that you can give only a selection of examples. However, there are none from Europe in this table. The EU spends billions of Euro each year on agri-environmental measure. many of those dedicated to carbon sequestration. Many case studies are available to show its effectiveness.	agreed. Will include 1-2 examples from Europe in final table or discussion (as the table may be shifted to text).	Martin Schönhart	University of Natural Resources and Life Sciences, Vienna	Austria
12237	31	1	31	3	Source, confidence and agreement levels are required.	agreed. Will incorporate in SOD	Mohammad Ibrahim Khalil	University College Dublin	Ireland
43057	31	1	31	45	This section maps the prevalence and proliferation of various carbon instruments over time, however falls short of assessing the effectiveness of these instruments, even in summary. While a detailed treatment of assessment might not be needed here as there is a section on assessment of mitigation options, a high level assessment of the effectiveness (cost and environmental), feasibility and transformative potential [refere chapter 13 for assessment criteria] of the major historical instruments would be merited to give a complete historical picture.	agreed. Will incorporate in SOD in revised section that combines FOD 7.4 and 7.7	Parth Bhatia	Centre for Policy Research, New Delhi	India
18155	31	1	31	46	This text lacks the quality required for an assessment. It renarrates previous studies or websites, but does not assess the literature.	agreed. Will incorporate in SOD	Helmut Haberl	Institute of Social Ecology, University of Natural Resources and Life Sciences, Vienna	Austria
38829	31	5	31	11	Would these protocols also be acceptable under CORSIA? Moreover, would these emission reductions or offsets be accepted under CORSIA?	will comment in SOD	Julian Reyes	Personal Capacity	United States of America
12239	31	13	31	33	As stated above, it is important to define 'Trading vs. Offseting' properly make the terms to the readers.	Agreed. Thanks.	Mohammad Ibrahim Khalil	University College Dublin	Ireland
9889	31	14	31	15	According to the reference quoted in line 14, volontary carbon markets have not "continued to grow", they have been peaking around 100 MtCO2e traded per year since 2008.	agreed. Language will be changed.	Valentin Bellassen	INRAE	France
590	31	16	31	16	"The larges share of annual sales..." I suspect that we talking here about where projects are been done on the ground rather than where the sales to clients happen. Sould be clarified.	Thanks. Will adjust.	Pierre Bernier	Natural Resources Canada	Canada
16937	31	16	31	16	Table X: table missing.	Agreed. Will be updated	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
22283	31	16	31	16	Table number should be indicated.	Agreed. Will be updated	Noureddine Benkeblia	The University of the West Indies	Jamaica
32009	31	16	31	16	remember to include table number in (Table X).	Agreed. Will be updated	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
26867	31	24	31	24	Australia? The Rudd government failed to get it passed in 2008 and Gillard actually got a carbon pricing scheme through in 2011. The Abbot government effectively torpedoed the carbon tax when it repealed the CEF and the conservatives set up a fund that is basically too small to meet the national targets	Thanks.	Louis Verchot	International Center for Tropical Agriculture	Colombia
39621	31	24	31	24	the country of Australia' reads in an odd manner. Rephrase if possible	Will be updated	Shobha Maharaj	Independent Consultant	Germany

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
22171	31	28	31	28	Missplelling on "potentailly"	Thanks.	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
10445	31	31	31	33	"New Zealand NOW treats..." - this sounds odd, since New Zealand has taken this approach ever since it first ratified the Kyoto Protocol. What would be more worth noting is how many countries do NOT take such an approach, i.e. fail to provide any (compulsory, comprehensive) incentives to prevent deforestation.	Thanks. Now removed. Note that under carbon rental schemes, do not need to treat harvests as a source, as long as only rents were paid and not full carbon price.	Andy Reisinger	NZAGRC	New Zealand
27311	31	32	31	33	This particularity for New Zealand would also apply for the other countries? Needs some contextualization	Thanks. Now removed. Note that under carbon rental schemes, do not need to treat harvests as a source, as long as only rents were paid and not full carbon price.	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
19235	31	35	31	65	The section claims indiscriminately REDD+ benefits (counted in ERs) even though effectively tropical deforestation is increasing, including in Latin America (see Global Forest Watch, and publications of the University of Maryland team (Hansen et al.)). The presumed emission reductions from REDD+ are largely hot air due to inflated baselines. It is essential for the credibility of this section to assess REDD+ benefits objectively. Not all the areas covered under REDD+ programs (it needs to be clarified what that means) are actually implementing measures. For example, UNREDD or the FCPF readiness fund largely support measures to build technical capacities. The FCPF carbon fund has so far only signed legal agreements with four countries, and it is not clear whether any of those has already entered into effectiveness. None of the programs has measured emission reductions. Generally, the successes of national REDD+ programs are ambivalent (Angelsen (2017), REDD+ as Result-based Aid: General Lessons and Bilateral Agreements of Norway, Review of Development Economics). However, REDD+ can work if there is an enabling policy framework and strong coalitions backing REDD+ (Korhonen-Kurki et al. 2019, What drives policy change for REDD+? A qualitative comparative analysis of the interplay between institutional and policy arena factors, Climate Policy). The case of Guyana is highly controversial and should maybe not highlighted so much as success: Hook, Andrew (2019) Following REDD+: elite agendas, political temporalities, and the politics of environmental policy failure in Guyana. Environment and Planning E: Nature and Space. pp. 1- 31. ISSN 1472-3433. Tim Laing (2019), Guyana's REDD+ Agreement with Norway: Perceptions of and Impacts on Indigenous Communities. The baseline that Norway used for measuring emission reductions was clearly inflated and one would have to look to which extend the emission reductions Roopsind et al. 2019 find are real. The UNFCCC Biennal Review would also have to be checked against Global Forest Watch and other independently verified data.	Many good points. Note the table 7.3 provides either numbers published in peer reviewed studies (Guyana), or numbers in biennial reviews and other official government documents, using UNFCCC approved approaches, including IPCC GPG for LULUCF carbon accounting. In some cases (e.g., Brazil), there is peer reviewed literature that backs up the effectiveness of the policies they implemented (e.g., Nepstad, Arima, Hargraves and Kis-katos, Asuncao). These and Roopsind et al are statistical analyses that capture policy impacts. Angelsen and Korhonen-Kurki make good points and will be adopted in the policy section, but they don't provide evidence on the success or failure of national or project REDD. Liang also is an excellent study, but doesn't examine whether the REDD program reduced deforestation. Note that section 7.7 discussed many of the broader issues beyond whether REDD actually reduces deforestation, such as impacts on different groups, whether existing inequalities are exacerbated, etc. These two sections will be combined in the SOD. On the final point of comparing GFW to Biennial Review data, that's an interesting point. GFW just records forest loss; it does not provide a counterfactual. The estimates based on Biennial reviews provided in the table are country level comparisons based on their stated reference level (their counterfactual) and their actual	Charlotte Streck	University Potsdam	Germany
19699	31	36	31	36	in this and numerous lines throughout the m.s. Simonet et al was (2018). Please recheck the publication year (probably should be 2019)	Thanks. The Simonet et al pub is in American Journal of Ag Economics, 2019; we also referred to the online version of the same article that appeared in 2018. Sorry for the confusion.	Mochamad Indrawan	Research Center for Climate Change - Universitas Indonesia (RCCC-UI)	Indonesia
22173	31	36	31	36	A period is needed after..."(REDD+)	thanks	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
38831	31	38	31	39	Bi-lateral infers two members but the example given only says Norway. If it is bi-lateral, Norway and who (many countries? Only one?)	thanks will clarify	Julian Reyes	Personal Capacity	United States of America
46513	31	39	31	45	Citations needed for this paragraph and for Table 7.3. Quantative evidence 'starting to emerge' does not seem like a literature assessment. How strong is the evidence that REDD is effective?	Biennial reviews are cited in text. Will cite in table as well.	Rachel Bezner Kerr	Cornell University	United States of America
9891	31	43	31	46	There is a strong presumption that counterfactual scenarios are overestimated in carbon management schemes, especially during the initial periods (eg. first period of the EU ETS, Forest reference levels of KP CP2, ...). The verification stringency of biennial reviews is also much lower than for the CDM which itselfs was not immune of baseline inflation. Therefore "we estimate" is a strong wording for such a sentence. The phrasing of the previous sentence "countries have claimed" is more appropriate.	Thanks. Will adjust language.	Valentin Bellassen	INRAE	France

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
14797	31	43	31	46	avoided CO2 emissions due to deforestation (7.5 Gt of CO2) is not mentiooned in table 7.3	Will clarify that REDD+ implies avoided emissions due to avoided deforestation (and degradation), but also in response to other comments, will adjust titles in table.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
26869	31	44	31	45	The emissions reductions in Brazil had nothing to do with the international REDD+ scheme. Deforestation reductions began in 2005, before REDD+ was a thing. See Nepstad et al (2014) Science. This comemnt applies also to Table 7.3. Be careful about attribution to REDD+ programs. Just because deforestation decreased in a given set of years, it does not mean that REDD+ was an effective program. Present the real drivers of decreased deforestation	Thanks. Will adjust titles in table to distinguish between reducing deforestation and the title REDD+	Louis Verchot	International Center for Tropical Agriculture	Colombia
39623	31	45	31	45	Change 'The largest share of these emissions reductions have occurred' to 'The largest share of these emissions reductions has occurred'	will revise.	Shobha Maharaj	Independent Consultant	Germany
44933	31	35	33	34	The claims of saved emissions due to REDD+ estimated of more than 7.5 Gt CO2 are not well substantiated scientifically, and they are highly contested. For instance, the claimed success of REDD+ in Guyana has been examined and critiqued by Hook, A. 2019. Following REDD+: Elite agendas, political temporalities, and the politics of environmental policy failure in Guyana. ENE: Nature and Space. Moreover: Most of the estimated saved emissions (6.9 Gt CO2) are from Brazil. However, due to policy changes of the Bolsonaro government, there is a question about how much of saved emissions that has been - and is likelyo be lost. This situation must be discussed in the chapter.	Thanks. We'll make more which estimates are from peer reviewed literature (e.g., Guyana, Brazil), which are from markets with established protocols (e.g., California, Australia) and which are estimates using approved IPCC and UNFCCC guidelines (those from Biennial reviews). The Hook article is not counterfactual and doesn't quantify changes; we use Roopsind et al., (2019) for Guyana. Agree about policy changes in Brazil, and we'll introduce more discussion about that in SOD.	Hanne Svarstad	OsloMet - Oslo Metropolitan University	Norway
20167	31	5		11	Also look at the Ecosystem Marketplace State of the Forest Carbon publications, which provide the best overview	thanks.	Henry Neufeldt	UNEP DTU Partnership	Denmark
29947	31	9			Is it need 'see' before website address?	thanks.	RAEHYUN KIM	Institute	Republic of Korea
14793	31	11			The reference or link of one/two protocols related to agricultural emission reductions or offsets can be given.	agreed.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
17789	31	16		16	Table X is missing	will updated in SOD meant table 7.3 here.	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
3411	31	16			table X ?	will updated in SOD meant table 7.3 here.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
21731	31	16			(Table X)	will updated in SOD meant table 7.3 here.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
29949	31	16			We need specific Table number which maybe Table 7.3.	will updated in SOD meant table 7.3 here.	RAEHYUN KIM	Institute	Republic of Korea
3413	31	28			potentially	thanks.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
1417	31	29			In California these would not be from avoided deforestation "projects", but rather from jurisdiction-wide emission reductions. The nation of Colombia does allow avoided deforestation projects to sell credits to offset tax liability under the country's carbon tax.	these are AFOLU offsets from CA which are comprised of agricultural and forest activities. Will clarify. Thanks for heads up on Colombia, will see if we can find data to quantify.	Jonah Busch	Earth Innovation Institute	United States of America
14795	31	35			COP 13 meeting in Bali (2007)	thanks.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
21733	31	35			COP meeting in Bali in 2007?	thanks	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
20169	31	36		46	Most of the REDD investment has been in readiness, so very little action has been achieved. This is largely because REDD generally did not address the drivers of deforestation, which tend to lie outside the forest. A lot of the successes in avoided deforestation also did not result from REDD policies but were largely domestic (see Brazil).	agreed. As noted in response to other reviewers, will clarify the titles for the rows in the text to distinguish avoided deforestation efforts from REDD+ efforts.	Henry Neufeldt	UNEP DTU Partnership	Denmark
3415	31	36			a dot after (REDD+).	Thanks.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
38833	31	38			The Forest Carbon Partnership Facility is also unique for implementing REDD+ at larger scales (i.e., jurisdictional to national) to achieve emissions reductions at scale. This seems to be an important point about achieving these REDD+ goals at the proper scale. Also, what are the scales of reduction and implementation for other programs	Thanks. Will discuss project versus jurisdictional/national more clearly in SOD.	Julian Reyes	Personal Capacity	United States of America
29957	31	42			Delete 'reducing' before 'forest degradation'.	thanks.	RAEHYUN KIM	Institute	Republic of Korea
6831	32	33	7	33	I would suggest rewording the title "Achieved emissions reductions achieved in AFOLU so far"	thanks. Will retitle for SOD	Valasia Iakovoglou	International Hellenic University	Greece

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
10541	32	1	32	1	Abbreviations (GNF, IKI etc) should be spelled out.	Thanks. Will do.	Hiroko Akiyama	National Agriculture and Food Research Organization	Japan
19701	32	1	32	1	Table 7.3 Achieved emissions reductions 1 achieved in AFOLU so far.	Thanks. Will retitle.	Mochamad Indrawan	Research Center for Climate Change - Universitas Indonesia (RCCC-UI)	Indonesia
19703	32	1	32	1	for this table, might worth specifying reference sources	Thanks. Also noted by another reviewer. Will do.	Mochamad Indrawan	Research Center for Climate Change - Universitas Indonesia (RCCC-UI)	Indonesia
28789	32	1	32	1	Previouse comment also for Table 7-3.	thanks.	Alireza Yazdani	Shiraz University	Iran
31947	32	1	32	1	Table 7.3: There should be a citation for all this info.	Thanks. Also noted by another reviewer. Will do.	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
32011	32	1	32	1	Table legend: 'Achieved emissions reductions achieved in AFOLU so far' needs to remove one of the achieved as it is repeated	Thanks. Will retitle.	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
38943	32	1	32	1	Tab 7-3. The title if this table is misleading vis a vis the emissions/removals data shown in the previous sections. The ''achieved'' in the title may lead a reader to thing that these reductions are part of thise accounted for in the previous sections. In fact, they are not. Here. ''achieved'' means only that they have been verified (at best) ithin a UNFCCC process, but it is unclear) whether they ahve been inserted in current or past NGHGI, nor b) whether any of this is picked up in the statistcs or models used to produce the AFOLU emissions/removals graphs in the previous sections.	Thanks for the comments. First, we will include citations in table to clarify where each comes from. Some come from peer reviewed literature, e.g., Guyana. Second, will clarify the extent to which some of them are included in inventories. The CA market for instance, is included in the US inventory. Third, will clarify links to earlier table, although the material will be re-arranged in the SOD.	francesco tubiello	FAO	Italy
43055	32	1	32	1	Kindly embed sources within the table. It might be good to provide rounded numbers to avoid the impression of false precision.	Thanks agreed.	Parth Bhatia	Centre for Policy Research, New Delhi	India
11295	32	1	32	2	Examples from Asia Europe and africa is not included in the table? How representative is this table?	There are some tons from Asia-Europe and Africa in CDM, Voluntary, and other areas that are not specified per country. We have broken out by system rather than region, except where we have large aggregates. We reviewed the bienniel reports for Africa and did not find emission reductions from deforestation claimed.	Mahmood Riyaz	Maldivian Coral Reef Society	Maldives
18153	32	1	32	2	What is the source of the numbers reported here? Where is an assessment how robust these stupidly exactoid numbers are? What can be learned from these numbers? Which of these projects was a success/failure, and what are the criteria for the success of the projects?	Thanks. Sources will be provided in SOD. Hopefully what individual countries report in the bienniel reviews, or in their legally binding trading systems, or in the CDM aren't stupid. Additional assessment of the numbers will be provided in the SOD.	Helmut Haberl	Institute of Social Ecology, University of Natural Resources and Life Sciences, Vienna	Austria
27315	32	1	32	2	Numbers need some rounding, too many digits displayed. Uncertainty ranges would be important	Will maintain tons, which are reasonably large units, in table, but use Pg or Gt in text.	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
38631	32	1	32	2	This is a table to cumulate the result of a part of actions relating to market mechanism. Thus the name of table 7.3 must reflect this fact. But my preference is deleting this table, as this section too much focus on market issue.	Not all are market based. Brazil, for instance, just reduced their emissions from deforestation through a variety of policies. Table will be re-titled in the SOD. Transactions between entities have had important effects on the landscape, which is what the table is trying to show. it doesn't constitute a large enough amount of money to achieve the size emission reductions required for a 1.5 degree target, but the exchanges of funds for carbon has undeniably been important.	Atsushi Sato	Mitsubishi UFJ Research and Consulting Co.,Ltd.	Japan
10581	32	4	32	12	Addditionality is not explained clearly in the paragraph	thanks. Will revise in SOD	Wen Zhang	Institute of Atmospheric Physics, Chinese Academy of Sciences	China
12077	32	4	32	12	For clarity, can additionality and leakage be described in this section.	thanks. Will include more discussion in the revised SOD.	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
38961	32	4	32	12	This paragraph is a bit confusing to read I think. Also, you say …. Widely discussed discussed in forestry and you cite only a work from 2007. You should avoid such phrases or add more recent literature.	thanks. Will include additional cites including earlier assessment reports.	Vassilis Litskas	Cyprus University of Technology; Open University of Cyprus	Cyprus
31967	32	6	32	6	General comment: it seems it all relies on land, I think it needs to link with the sea not only as there is sequestration potential in the sea but also due to their implicit interaction as food is also produced in the sea and pollutants run from land to water. There is also the effect of CC with flooding agricultural land affecting crops and livestock. There is also the use of seeweed to feed livestock so there is direct interaction between all land uses. The loss of agricultural land due to sea rise needs to be considered.	Good points. Thanks. See discussion on mangroves and coastal mitigation in section 7.4. Drivers section also discussion deforestation and management of mangroves. Also note that flooding and other impacts are addressed in WGII.	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
19247	32	6	32	12	The previous section that elaborates on the benefit of REDD+ relies on national and jurisdictional program data. These programs do not establish additionality and do not pass an additionality test (additionality is captured in the reference level). While this section seems to refer largely to (A/R) projects which leads to a slight inconsistency or confusion since the different reference points are not explained.	Not clear what "previous section" is referred to, so assume it's table 7.3. All of the numbers incorporate an approved methodology for determining a reference level, and hence additionality (e.g., CDM has methods for determining a reference level and additionality; Brazil's numbers reported from their biennial report use IPCC and UNFCCC methods for a reference level). Will make this more clear in SOD, and will include more assessment about the approaches to determine additionality that have been used.	Charlotte Streck	University Potsdam	Germany
39625	32	7	32	7	Change 'would likely have held' to 'would be likely to hold' or 'would likely hold'	thanks.	Shobha Maharaj	Independent Consultant	Germany
32013	32	9	32	10	check grammar: ' It is plausible to test for additionality after the fact using'	thanks.	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
16631	32	14	32	14	When you are discussing permanence issues you might also consider the fact that the ways in which you pay, whether or not it is a maintenance fee and differential accumulation of carbon over time plus the length of the contract all influence the net value of a particular carbon sequestration prospect. This is covered inKim, Man-Keun & McCarl, Bruce A. & Murray, Brian C., 2008. "Permanence discounting for land-based carbon sequestration," Ecological Economics	thanks. Will improve discussion in SOD.	Bruce McCarl	Texas A & M University	United States of America
32015	32	14	32	14	Correct for repetition in: 'Permanence requirements require', canbe changed for 'Permanence requirements necessitate'	thanks	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
39627	32	14	32	14	Permanence requirements require' sounds too repetitive - recommend rephrasing	thanks	Shobha Maharaj	Independent Consultant	Germany
26873	32	16	32	16	There is a lot of recent literature on this, there is no need to go back 25 years. Update the reader on the current understanding of permanence and leakage.	thanks for the comment. Note, however, that it's not clear that this point is well known or even understood in the context of permanence. Will try to make more clear in the SOD.	Louis Verchot	International Center for Tropical Agriculture	Colombia
244	32		32		Table should benefits of more information such as the the type of work done and target. How the reduction was calculated (ref) and, if available, the cost-benefit	Good points. We will include more information in SOD, however, we will not be able to include full benefit/cost as that information is not available.	Diego Morgavi	INRAE	France
1421	32	3	33	34	this section would be stronger if it first defined additionality, permanence, and leakage as phenomena, and only afterward describe how they have been addressed by funding mechanisms	thanks. Good point. Will be included in SOD.	Jonah Busch	Earth Innovation Institute	United States of America
18157	32	3	33	34	Only partially meets standards for an assessment. E.g. many vague formulations (e.g. "or other sources of information" - which?). Based on a small subset of this literature only, needs to be corroborated. E.g., the C neutrality of bioenergy is a huge topic with hundreds of publications meanwhile, but the respective paragraph does not even contain one citation - in an assessment one would expect careful selection of key references and weighting of arguments as a basis for drawing a well-founded conclusion. Similar problems in most of this text.	Thanks. Will do more on assessment in SOD.	Helmut Haberl	Institute of Social Ecology, University of Natural Resources and Life Sciences, Vienna	Austria
26871	32	3	33	34	This section needs a lot of work. It is factually wrong, not up to date, and the concepts are not clear.	Agree that we need to be more clear, but disagree that the data and evidence are not up to date. Impact analysis has recently been widely used to assess additionality in a number of important and widely cited cases, e.g., Andam has 843 cites and is in PNAS. This is new to the IPCC AFOLU chapter, but is important to include given that it is how assessment of projects is begin conducted. The leakage analysis represents the most up to date estimates of leakage. Roopsind 2019 has an extensive literature review on leakage, and we have included many of the same papers here.	Louis Verchot	International Center for Tropical Agriculture	Colombia

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
32881	32	3	33	34	At the beginning of this section the authors should introduce the subject of forest carbon accounting, give an outline of why it is necessary for proper mitigation and mitigation funding (or confidence of funders) before delving into the three ideas (additionality, etc.). The authors should not assume readers know the field already.	Thanks. Will be addressed in SOD	Cheah Singfoong	Independent consultant, formerly more than 10 years with the National Renewable Energy Laboratory, USA	United States of America
37081	32	3	34	15	This section should include text documenting the need to create guidance around permanence and additionality that make sense for complex, dynamic biological systems such as soil. Current guidance around these topics do not fit most agricultural systems and there is a need to create this guidance.	Thanks. Good point. Will be addressed in SOD	Jeffrey Seale	Bayer Crop Science	United States of America
19249	32	3	34	39	This section seems to rely largely on old or even outdated literature on forest carbon projects, with the exception of the 2019 Roopsind study on Guyana's national program which seems uncharacteristically positive of the program (checking against other literature fund). Generally, it is important to distinguish between forest carbon projects (issuing tradable credits under voluntary programs or the CDM) and national REDD+ programs (supported by bilateral or multilateral payments but not issuing credits). The section would need to be updated with differentiated and nuanced discussion of projects and national programs, including challenges and benefits (see - grey literature, but for relevant background: https://www.climatefocus.com/sites/default/files/Should%20forest%20carbon%20credtis%20be%20included%20in%20CORSIA_0.pdf)	Disagree that the data and evidence are not up to date. Will make more clear the departure from previous ARs, which did not include an assessment of impact analysis, which has grown increasingly important in the environmental evaluation literature in the last decade, since the Andam et al study in 2008. Impact analysis has been widely used to assess additionality in a number of important and widely cited cases, e.g., Andam has 843 cites and is in PNAS. This is new to the IPCC AFOLU chapter, but is important to include given that it is how assessment of projects is begin conducted. The leakage analysis represents the most up to date estimates of leakage. Roopsind 2019 is one of the most recent impact analysis on forest projects, and conducted an extensive literature review on empirical studies that examined leakage. We have included many of the same papers here. The reviewer makes an interesting point about whether tradeable credits in voluntary programs or the CDM are the same as credits in national REDD programs. We will point this out in the SOD. Agree that we need more discussion of these points and will include in SOD.	Charlotte Streck	University Potsdam	Germany
38707	32	3	39	30	Too much focous on forest, what about other land ueses and agriculture? An too much focus on REDD+ within forest. Can the authros give a more comprehsive and balance overview in the "AFOLU sector"	Thanks. Will include more about other uses in SOD.	Maria Jose Sanz Sanchez	Basque Center for Climate Change	Spain
16581	32	14	#REF!	####	When you are discussing permanence issues you might also consider the fact that the ways in which you pay, whether or not it is a maintenance fee and differential accumulation of carbon over time plus the length of the contract all influence the net value of a particular carbon sequestration prospect. This is covered inKim, Man-Keun & McCarl, Bruce A. & Murray, Brian C., 2008. "Permanence discounting for land-based carbon sequestration," Ecological Economics	thanks. Will discuss.	Bruce McCarl	Texas A & M University	United States of America
1419	32	1			Ecuador also has claimed emission reductions from deforestation, which have been compensated through the Green Climate Fund	Thanks. We were unable to incorporate GCF in FOD, but plan to for SOD.	Jonah Busch	Earth Innovation Institute	United States of America
3417	32	1			table 7.3, twice "achieved" in the title	Thanks	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
14799	32	1			Title: Emission reductions achieved in AFOLU so far	thanks	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
47673	32	2			table 7.3 - references missing	Thanks. Will include in SOD	raphael Slade	Imperial College	United Kingdom (of Great Britain and Northern Ireland)
20171	32	3			This could be shortened. At the same time, it would be nice to get figures on permanence and leakage of forest carbon projects.	thanks	Henry Neufeldt	UNEP DTU Partnership	Denmark
29951	32	5			Is it need 'see' before 'Murray et al., 2007'?	thanks	RAEHYUN KIM	Institute	Republic of Korea
3419	32	8			erase "using"	thanks	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
3421	32	14			erase "requirements"	thanks	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
3423	32	14			it is "requires"	thanks	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
29593	32	20			Favero et al. 2019; Add this article to the reference	it's 2020, but will include	RAEHYUN KIM	Institute	Republic of Korea
29953	32	20			Is it need 'see' before 'Favero et al., 2019'?	thanks	RAEHYUN KIM	Institute	Republic of Korea
26877	33	21	22	27	What about displacement of activities?	thanks. Will clarify that what non-economists call displacement or activity shifting is what economists call leakage either in outputs (e.g. timber harvesting, or inputs, eg. laborers moving from one place to another).	Louis Verchot	International Center for Tropical Agriculture	Colombia
32017	33	2	33	2	Check grammar: 'the credits for the site have the relinquished '	thanks.	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
26875	33	6	33	13	I don't see the point of this paragraph and most of it is factually wrong. How can carbon neutrality be about emissions at the time of harvest? What are carbon protection protocols? Delete the paragraph.	Thanks. Note that carbon neutrality in the biomass debate is entirely about emissions at the time of harvest and whether and how quickly those emissions will be re-sequestered. Nearly all carbon programs, whether voluntary markets, offsets in trading markets, or national level programs, have carbon protection protocols that ensure the integrity of the carbon from leakage, and ensure additionality and permanence. Will improve wording to make more clear the salient points about the importance of these measures.	Louis Verchot	International Center for Tropical Agriculture	Colombia
6833	33	7	33	9	I would suggest rewording	thanks.	Valasia Iakovoglou	International Hellenic University	Greece
27317	33	11	33	13	There are several initiatives and papers that claim that this is not suffiicient, e.g. because the carbon-stock reducing effects of harvest (as carbon stocks are in a steady-state with losses, including harvest and productivity) are omitted, e.g. 10.1111/gcbb.12643, 10.1038/s41467-018-06175-4, see also 10.1016/j.ecolind.2019.106057	these are all good papers that should be included in a discussion of carbon neutrality of biomass energy in the SOD, however, it's not clear how this relates to the leakage discussion in the lines noted?	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
32879	33	15	33	34	The authors should not assume the readers know what "leakage" is. Having even just a one line explanation at the beginning of these three paragraphs, e.g., "leakage occurs when reduction in timber harvesting at one site causes an increase in harvesting elsewhere..", would be very helpful and useful to the readers.	thanks. Will improve for SOD	Cheah Singfoong	Independent consultant, formerly more than 10 years with the National Renewable Energy Laboratory, USA	United States of America
25765	33	21	33	27	This paragraph is difficult to grasp- suggest expansion to clarify/ use of more accessible language.	thanks. Will improve for SOD	Helen Hughes	University of Edinburgh	United Kingdom (of Great Britain and Northern Ireland)
32019	33	23	33	23	The presentation of references needs to be consistent: here 'as described in (Gan and McCarl, 2007', with the parenthesis left before the authors, further doen the text: 'analyzed in Alix-Garcia' there is no parenthesis before authors.	thanks	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
17929	33	37	33	37	Could this paradox not just be because of inadequate policy implementation of solutions that might have considerably helped e.g. carbon tax if adopted?	Thanks. Will revise to be clear that implementation challenges are being conflated with trade off challenges	Luke Spajic	University of Adelaide (graduate student researcher), University of Oxford (visiting student researcher)	Australia
26879	33	40	33	42	What is the evidence for this statement. There are places where pollution is declining and places where it is getting worse. This is an IPCC document, please summarize the science.	Thanks. I was referring to IPCC science when referring to overall levels. I will nuance this point	Louis Verchot	International Center for Tropical Agriculture	Colombia
6835	33	42	33	45	I would suggest adding realted references	Accepted	Valasia Iakovoglou	International Hellenic University	Greece
32021	33	49	33	49	text: '"finance and market" (FMD) driven' should be "finance and market" driven (FMD)	Noted	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
44635	33	7	37	35	While I agree with many aspects of what is stated in this box it still strikes my as odd, not only because it seems to be written by a single author (several "I" phrases), leaning on a small range of literature dominated by one school of thought (with a lot references involving a particular author). But even if that weren't the case, it's not clear to me what the role of this box is supposed to be, because most of it (the theoretical background in policy studies) is not AFOLU-related and would need to feed into ch13. Furthermore, I'm not sure the box does what it says, namely dealing with the challenge of a "growing diconnect between the climate crisis and historical solutions". I think the length of the box should be cut down in any case, and some parts of could be moved to other places within ch7.	Agree and will be changed	Oliver Geden	German Institute for International and Security Affairs	Germany
19251	33	7	37	37	This box is very long and detailed, somehow disproportional to the truncated discussion on REDD+.	Agreed. Box to be incorporated into text	Charlotte Streck	University Potsdam	Germany
3427	33	34	37	35	Who is "I" in the box 3.2 ?	Thanks. text to be changed.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
246	33	37	37	35	Difficult to grasp the utility of this Box for the document. In any case, it is too long; it mainly cites the work of a group of researchers and it is written in first person what seems contrary to the spirit of a multi-authored report	Noted	Diego Morgavi	INRAE	France
592	33	37	37	35	This long 4-page box written in the first person is very interesting in expressing the dire reality of seemintly futile efforts in generating consequent amounts of sequestered carbon through AFOLU projects. However, it also seems disconnected with the rest of the text, as if it was the expression of a dissenting opinion, an impression that is reinforced by the lack of cross-over of references between the box and the rest of the chapter. If this box is really needed, I would strongly recommend a significant reduction in its length (e.g. max 1 page), and the introduction of the concepts contained in the box as part of the evaluation of actions and option presented in other parts of the chapter. I would correct an error in "Example 3" (p. 37, l. 19-20): moose don't graze but browse, so their presence does not lead "to soil disturbance that increases carbon emissions".	Accepted. Text will be changed	Pierre Bernier	Natural Resources Canada	Canada
1423	33	37	37	35	it is unclear why this lengthy musing has been included as a box. Perhaps its main point could be condensed in a much shorter text.	Accepted. Text will be changed	Jonah Busch	Earth Innovation Institute	United States of America
6727	33	37	37	35	This section is very long and contains a lot of self-citation - could be condensed strongly to still refelct the same points	Accepted. Text will be changed	Ken Giller	Wageningen University	Netherlands
9819	33	37	37	35	This seems to be a rather personal view (only few literature references) on the treated topics and raises some questions on the added value of this text box. It is suggested to rephrase in a more objective, scientific way, to substantially shorten the text, to write in a less personal driven style, format. Difficult to follow the author's string of messages, explanations, thoughts, as based on a too philosophic approach. Use less emotional language (e.g. sanguine beliefs, expectations), even where cited from other literature sources. Consider to leave out this text box.	Noted. Revisions will also make clear that different styles of presentations of research often bias some source of knowledge over others. But the point is still well taken	Jeanne Bormann	Ministry of agriculture	Luxembourg
9893	33	37	37	35	This box begins interestingly (with the observation that volontary FMD have failed to alter emissions trends in AFOLU) and ends interestingly (with three "positive examples"). What is in between is unclear (after criticizing FMD proponents for their will find new designs that will work, the authors propose three advice for policy design) and seemingly misses the point. Mainstream economic theory makes it clear since Pigou and Coase that for global externalities like climate change State intervention is necessary. Chapter 3 of this draft report clearly confirms this by reviewing empirical research on the effectiveness of State interventions (taxes and cap-and-trade mostly) and showing it works. Therefore, what matters it political will (and societal acceptance/compliance) to enforce mandatory carbon management schemes versus relying on soft and volontary FMD schemes. I expect that opinion may vary partly on this but clearly the solutions proposed in this box are too opinionated and not enough supported by theoretical and empirical litterature to reach the standard of an IPCC report.	Overall disagree. the reviewer's response that "it works" needs more clarification and evidence. The argument that the problem is "political will" is vague and abstract. However, the same critique can be made of the way I wrote the draft of this box, and hence it will be rewritten accordingly and streamlined into the broader review.	Valentin Bellassen	INRAE	France
12079	33	37	37	35	Box 7.2 shows some good examples. The examples would benefit from being rewritten for clarity.	Agreed. This will be changed	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
16721	33	37	37	35	"Box 7.2 The challenge: growing disconnect between the climate crisis and historical solutions" looks like a box to introduce the studies conducted by "Cashore". Most of the references in this box are his studies.Need to review more literature. Also messages are unclear.	Noted	KANAKO MORITA	Forestry and Forest Products Research Institute	Japan
17279	33	37	37	35	Please revise the text in the box and include more references that have not been written by the author of this text.	Noted	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany
17791	33	37	37	35	This Box 7.2 needs a thorough revision. Its content is hardly understandable. It would be appreciated a clearer structure and wording. It would be also better to remove personal comments as "as I do below", better "as it is presented below". Ensure that the references are reachable, some of them are not clearly reachable. For instance, Cashore et al 2018; Is this a conference given in a workshop or is a reachable publication?	Agreed. This will be changed	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
20173	33	37	37	35	This box is much too long and needs to be written in IPCC assessment style. There are also quite a few prescriptive statements that need to be changed. Please also look at the ODI report (2015) mentioned earlier. Finally, it's also never a good idea to self-reference to the degree this is done here.	Agreed. This will be changed	Henry Neufeldt	UNEP DTU Partnership	Denmark
25767	33	37	37	35	Box 7.2: Until the examples at the end, the main points made in this box are not unique to AFOLU. It needs to be clear in the writing why this box is included (at all, and also here rather than at any other point). It should be much briefer and the tone corrected to fit the rest of the report.	Agreed. This will be changed	Helen Hughes	University of Edinburgh	United Kingdom (of Great Britain and Northern Ireland)
27319	33	37	37	35	Box: the text is too long and hard to follow. Some revision towards improved messaging and the use of uncertainty language is needed - but the content is very interesting for the AR6	Agreed. This will be changed	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
43059	33	37	37	35	Chapter 13 has a section on policy processes (section 13.4) and a section on policy packages (13.6), which address some of the issues addressed here such as the role of various actors in poicy processes and the challenges of designing packages in the presence of existing institutions. There is scope to cross pollinate references from those sections to strenghten this box.	Very useful point. Noted this will be changed	Parth Bhatia	Centre for Policy Research, New Delhi	India
39783	33	37	37	37	I appreciate the passion in this box, but I am concerned it might be counterproductive, by alienating those who need to get the message. Has this text been agreed by the Chapter author team? It should be stated if this is so, otherwse It reads like a rant by Cashore!	Disagree. We shouldn't be worried about whether a research finding might alienate colleagues. Such a worry could undermine the scholarly enterprise, and reinforce methodological hegemony. The approach offered here is well understood and applied within some strands of social science. It is not a rant, but a particular way of generating knowledge. I appreciate that, like any interdisciplinary exercise, it is impossible for anyone, including myself, to have a complete appreciation of these differences. At the same time, I agree that this can be modified to come across more as an important set of questions that a number of scholars are contributing to, rather than simply rely on my recent meta analysis.	David Manning	Newcastle University	United Kingdom (of Great Britain and Northern Ireland)
38725	33		37		Box 7.2. The box is too long it will make more senses to include this information on the text. It has lot´s of overlaps and some of the messages are key.	Noted.	Maria Jose Sanz Sanchez	Basque Center for Climate Change	Spain
29955	33	21			Is it need 'see' before 'Roopsind et al.,2019'?	thanks.	RAEHYUN KIM	Institute	Republic of Korea
3425	33	34			Please to introduce the box 7.2	noted	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
10449	33	37			The box is full of prescriptive language, written in text-book style. It comes across as an opinion piece, not an assessment of the literature. Many of the statements about policy design are highly generic and covered in chapters 4 and 13. I would urge the authors to re-consider the need for and value from this box, and if it is retained, ensure it provides a policy-neutral literature assessment that answers specific questions that the chapter needs to answer	Noted. See comments on 717	Andy Reisinger	NZAGRC	New Zealand
21735	33	52			corporate social responsibility (CSR)	Noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
22681	33				I'm not sure what you mean by leakage. Please clarify.	thanks. Will provide definition of leakage in SOD	Melissa Lucash	Portland State University	United States of America
16939	34	19	24	19	"First I argue..." why is first person used?	Noted	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
26881	34	9	34	15	What science are you assessing here? What evidence is being ignored? Who is exchewing FMD? It would be better to summarize secientific assessments of these different instruments	Agreed. Text will be changed	Louis Verchot	International Center for Tropical Agriculture	Colombia
40379	34	14	34	14	"as I do below" - who is a author? Reference is needed	Noted	Gunta Kalvane	University of Latvia	Latvia
9817	34	14	34	15	Should fragments of the text be written in the first person? Reoccurs also in passages below.	Noted	Jeanne Bormann	Ministry of agriculture	Luxembourg
38835	34	14	34	15	This is unscientific language and an opinion. A scientific assessment should not use the first-person and/or promote ideals. This is a policy-neutral assessment that is not prescriptive.	Noted. Stylistically this will be changed. However, this is not an opinion piece. Still, the presentation can be made clearer, and it can refer to a broader set of literatures that are finding these types of disconnects, rather than referring mostly to my collaborative work.	Julian Reyes	Personal Capacity	United States of America
38839	34	14	34	17	This is an opinionated statement that prescribes a certain policy action. Please delete. Otherwise, please back this up with scientific literature.	Disagree. The article is written in a certain style that reflects long standing approaches to knowledge generation. This will be made clearer have	Julian Reyes	Personal Capacity	United States of America
38841	34	14	34	17	Box 7.2 – This entire section is poorly written and inappropriate for a scientific assessment. The use of first-person connotes an agenda for an assessment that is supposed to be policy-neutral. Moreover, there is much opining and advocating for certain positions using the text without much scientific backing or statistics. This is unscientific and prescribes, which are not values the IPCC reports should eschew. Please re-consider the content of this box.	I disagree that this is unscientific. However, I to accept that the style can be changed. I also agree that it can be made clearer about the research designs and methods from which it draws	Julian Reyes	Personal Capacity	United States of America
46515	34	14	34	19	This section is written in the first person, and needs to be rewritten as an assessment by the full chapter team.	Agreed. Text will be changed	Rachel Bezner Kerr	Cornell University	United States of America
26883	34	17	34	39	Typically IPCC reports are not written in the first person. It might be useful to cite a broader body of literature including papers by Bäckstrand & Lövbrand (2019), etc. The report is an assessment of the literature, not a summary of the author's work. This section looks like a copy and paste from another publication. I think it is important to point out the underlying world views implicit in different appraoches, particularly market based approaches.	Agreed. Text will be changed	Louis Verchot	International Center for Tropical Agriculture	Colombia

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
31951	34	17	34	39	L 20-33. This is a very important and informative section. However, there are several points that must be improved upon. Firstly, the reference 'Cashore (2018)' seems to be a conference/workshop manuscript, and I could not get a copy of it. It will be great if this was updated with a journal paper, or such. Secondly, the reference 'van der Ven, Rothacker, and Cashore 2018' does not seem to talk about the policy innovation/environmental degradation paradox. Also, this para would be much more effective if it was shorter.	Agreed. Text will be changed	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
44415	34	31	34	39	Despite tradition of the term in some literature, the notion of good governance is morally charged, and not a neutral and scientific notion of governance which, on the other hand, can be qualified by any of its multiple forms. It undergirds a program of bureaucratic and societal reform, and not everyone regards good governance as a self-evident positive contribution to public welfare. This can lead to certain governance arrangements becoming regardes as good in and of themselves rather than as reflections of particular (and contestable) political worldviews. Mitchell, J.K. (2015). Governance of Megacity Disaster Risks: Confronting the Contradictions. In Fra.Paleo, U. (ed.) Risk Governance. The Articulation of Hazard, Politics and Ecology. Dordrecht: Springer. pp. 413-439.	Most appreciate this excellent feedback. Text will adapt accordingly	Urbano Fra Paleo	University of Extremadura	Spain
37083	34	40	34	40	I believe the title here is meant to read Climate Friendly Agriculture	Noted	Jeffrey Seale	Bayer Crop Science	United States of America
26885	34	42	35	9	There is a similar problem here, the author cites only his own work and does not assess the literature. There is no uncertainty language here and the author is telling policy makers that they are required to follow certain pathways. IPCC is not policy prescriptive, This section needs to be reworked into an assessment.	Noted, thank you	Louis Verchot	International Center for Tropical Agriculture	Colombia
21737	34	4			(Grabs Forthcoming 2020, Buntaine, Parks, and Buch 2017). What is this??? Literautr?	Noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21739	34	14			as I do below (I???)	Noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
47675	34	14			"any effort to identify practical tools, as I do below," - don't use first person	Noted	raphael Slade	Imperial College	United Kingdom (of Great Britain and Northern Ireland)
21741	34	18		19	I argue? I sould be changed…	NOted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
38837	34	18			Please do not use first person in a scientific assessment. Moreover, this is a policy-neutral assessment that should not "argue" or advocate for anything.	NOted	Julian Reyes	Personal Capacity	United States of America
6837	34	23			I would suggest using a different word for "reinforced"	Noted	Valasia Iakovoglou	International Hellenic University	Greece
21743	34	32		33	such as : livelihoods, environment and economic growth as synergistic with each other (Cashore and Nathan, 2019)	Noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21745	34	38			Sustainable Development Goals (SDGs), themselves the product of "better designed" Millennium Development Goals (MDGs),	Noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
22683	34	39			Omit "problem focused".	Noted	Melissa Lucash	Portland State University	United States of America
38085	34	39			are to BE effectively implemented	Noted	Craig Jamieson	Straw Innovations Ltd	Philippines
14801	34	40			Shoiuld be Climate friendly agriculture and forestry policy	Noted	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
38083	34	40			climate friendly	Noted	Craig Jamieson	Straw Innovations Ltd	Philippines
21747	34	42			space	noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
22685	34	45			Replace with "ameliorate" instead of dent.	noted	Melissa Lucash	Portland State University	United States of America
22687	34	46			Replace with "This will have serious repercussions for the livelihoods.."	noted	Melissa Lucash	Portland State University	United States of America
6839	35	10	35	25	Please check the format. Also the Figure is not so clear.	noted	Valasia Iakovoglou	International Hellenic University	Greece
9821	35	10	35	26	Problem with text alignment around the table.	noted	Jeanne Bormann	Ministry of agriculture	Luxembourg
28997	35	10	35	26	Please move the table, it is overlap the paragraph around it. Also, I think it is figure not table.	noted	Marissa Malahayati	National Institute for Environmental Studies	Japan
38963	35	10	35	26	The table covers the text. Also, increase the fonds of the table.	noted	Vassilis Litskas	Cyprus University of Technology; Open University of Cyprus	Cyprus
32023	35	10	35	27	check format of paragraph with table	noted	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
26887	35	27	35	35	Everything is Casore, is anyone else writing about this? Where is the assessment part of this? Nothing in this section relates to the title of the box. If there is not a body of literature to assess, I suggest deleting the box	Agreed. text will be changed	Louis Verchot	International Center for Tropical Agriculture	Colombia

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
21749	35	4		10	format, justify	noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
3429	35	9			The title of the table 1 is not at the fair place	noted	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
21751	35	10		27	format	noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
29631	35	10			Hall's 1993; Add this article to the reference	nonte	RAEHYUN KIM	Institute	Republic of Korea
3431	35	29		30	The meaning of the sentence is not clear	agreed. text will be changed	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
21753	35	38			Stirling, 2010)	noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
29549	35	43			Cashore et al. 2019; Multiple articles with the same author and year in the reference	agreed. text will be changed	RAEHYUN KIM	Institute	Republic of Korea
21755	35	44		45	re-write:(Cashore, Auld, et al. 2016) (Levin et 45 al. 2012) (Rosenbloom, Meadocroft, and Cashore 2019) (Geels 2018)	agreed. text will be changed	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
26889	36	1	36	13	IPCC reports are not written in the first person, this is one person's opinion. No assessment of evidence is made, no generalizable conclusions ard drawn from the literature, no assessment is made and not uncerainty language is used. Please make this an assessment or delete it.	agreed. text will be changed	Louis Verchot	International Center for Tropical Agriculture	Colombia
26891	36	14	36	17	Delete, this does not tell us anything.	Disagree. See comments above	Louis Verchot	International Center for Tropical Agriculture	Colombia
38965	36	15	36	15	EU belongs to the international community; why to separate?	noted	Vassilis Litskas	Cyprus University of Technology; Open University of Cyprus	Cyprus
31949	36	27	36	27	At the same time': space missing before start of sentence.	noted	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
14909	36	29	36	29	Title "Example #1: 1990s British Columbia Protected Areas" should indicate that British Columbia is a province of Canada	agreed. text will be changed	Ana Blondel	Environment and Climate Change Canada / Government of Canada	Canada
32025	36	32	36	32	the phrase: 'approach included mandated ' should be 'approach included mandating'	agreed. text will be changed	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
32027	36	33	36	33	the phrase: 'and to implementing ' should be 'and implementing '	agreed. text will be changed	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
46517	36	46	36	46	This is an interesting case study, but would be a stronger case if specific results were mentioned in terms of how much forest had been sustained over time. The same point is true of other case studies in this box	agreed. text will be changed	Rachel Bezner Kerr	Cornell University	United States of America
11297	36	18	37	30	Geographic disperson of examples would have been more useful	agreed. text will be changed	Mahmood Riyaz	Maldivian Coral Reef Society	Maldives
46235	36	18	37	31	Positive Examples: Add the example of the Kayapo Territory in Brazil where rights for indigenous people plus modest exteranl support and resourcing has helped the kayapo develop livelihhods based on cultural practice and defend their territory from illegal logging, mining and other incursions keeping their prinary forests and other ecosystems largely intact over the past 25 years. The impact of support for the Kayapo was starkly evident during the 2019 fires in the Amazon where fire clearly spread along pathways oif deforestation and logging roads but not impactunfragmented areas of the Kayapo primary forests. (Griiffith University Primary Forest Research Programme).	Very useful comment. the revision can do a better job in both identifying overall trends, but also highlighting cases that appear to go in positive directions, and the need to understand why this is so (including existing research findings on this)	Virginia Young	Australian Rainforest Conservation Society, Griffith University, CAN Ecosystems	Australia
26893	36	18	37	35	This section is useful and draws from multiple sources. There is a rich literature on REDD+ from CIFOR and others, Angelsen, Brockhaus, Busch, Seymour, Di Gregorio. A more nuanced treatment of the governance issues beind the trajectory of REDD+ can be developed.	agreed. text will be changed	Louis Verchot	International Center for Tropical Agriculture	Colombia

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
44935	36	18	37	35	There are three 'positive examples' provided of micro level cases regarding the role of agriculture and forest in adressing the climate crisis. Two of these cases are from Canada and one from Peru, all of them are about forest. A conclusion is made that these cases 'could be applied to a wide variety of cases, from conservation efforts in Southesast Asia, Latin American and Africa.' Although not clearly presented, the message seems to be that more participation and deliberative processes involving stakeholders will solve the problems of REDD+ efforts, as these efforts over a decade 'have failed to materialize in any significant manner.' Instead of assuming this deliberative stakeholder processes as a quick fix for REDD+, there is a need to engage with the research literature that actually present in-depth studies of implementations, impacts and consequences of REDD+ programmes and projects areas in different countries and discuss reasons for problems and failures. A major problem often reported is that REDD+ has not been implemented in ways that have compensated vulnerable and poor people for losses of livelihoods. Here are a few relevant references: Howson, P., Kindon, S. 2015. Analysing access to the local REDD+ benefits of Sufngai Lamandau, Central Kalimatan, Indonesia; Asiyanbi, A.P. A political ecology of REDD+: Property rights, militarised protectionism, and carbonised exclusion in Cross River. Geoforum; Svarstad, H., Benjaminsen, T.A. 2017. Nothing succeeds like success narratives: A case of conservation and development in the time of REDD. Journal of Eastern African Studies 11(3), 482-505; Milne, S. et al. 2019. Learning From 'Actually Existing' REDD+: A Synthesis of Ethnographic Findings. Conservation & Society.	agreed. text will be changed	Hanne Svarstad	OsloMet - Oslo Metropolitan University	Norway
6841	36	6			" For these reasons, I ...". I would suggest avoiding "I".	noted	Valasia Iakovoglou	International Hellenic University	Greece
21757	36	7		9	why bold?	nonte	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21759	36	12		13	re-write: Bernstein and Cashore 2012, Yona, Cashore, and Schmitz 2019).	noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
6843	36	22			(Streck et al. ,...what year?	noted	Valasia Iakovoglou	International Hellenic University	Greece
21761	36	25			Germany in 2010 and Subak in 2002?	noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21763	36	27			we?see the previous comment	noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21765	36	36			Finally,...	noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21767	36	42			At the same time,	noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
6845	36	47			Change " Indigenous Peoples" to " Indigenous People"	noted	Valasia Iakovoglou	International Hellenic University	Greece
46519	37	1	37	14	This is the first mention of Indigenous People, indigenous righs and indigenous knowledge, in relation to those groups who are dependent on forests. This is also an interesting case study but earlier mention of indigenous rights and knowledge should be brought into the chapter in relation to mitigation and conservation efforts, as well as tradeoffs, with more literature assessed. See for example: Vergara-Asenjo, G., & Catherine Potvin. (2014). Forest protection and tenure status: The key role of indigenous peoples and protected areas in Panama. Global Environmental Change, 28, 205–215. http://dx.doi.org/10.1016/j.gloenvcha.2014.07.002 and Blackman, A., Corral, L., Santos Lima, E., & Asner, G. P. (2017). Titling indigenous communities protects forests in the Peruvian Amazon. Proceedings of the National Academy of Sciences of the United States of America, 114(16), 4123.	agreed. text will be changed	Rachel Bezner Kerr	Cornell University	United States of America
32029	37	19	37	19	correct: 'soild '	Editorial	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
44417	37	40	37	40	Despite tradition of the term in some literature, the notion of good governance is morally charged, and not a neutral and scientific notion of governance which, on the other hand, can be qualified by any of its multiple forms. It undergirds a program of bureaucratic and societal reform, and not everyone regards good governance as a self-evident positive contribution to public welfare. This can lead to certain governance arrangements becoming regardes as good in and of themselves rather than as reflections of particular (and contestable) political worldviews. Mitchell, J.K. (2015). Governance of Megacity Disaster Risks: Confronting the Contradictions. In Fra.Paleo, U. (ed.) Risk Governance. The Articulation of Hazard, Politics and Ecology. Dordrecht: Springer. pp. 413-439.	agreed text will be changed	Urbano Fra Paleo	University of Extremadura	Spain
46521	37	40	37	50	This section does not explain the criteria for 'good governance' and it seems to suggest that it includes private sector governance over forest protection, from the example provided. What is the evidence that this model will increase forest protection? More assessment of literature needed e.g. Abrams J, Nielsen E, Diaz D, Selfa T, Adams E, Dunn JL. How Do States Benefit from Nonstate Governance? Evidence from Forest Sustainability Certification. Global Environmental Politics. 2018;18(3):66-85.	agreed text will be changed	Rachel Bezner Kerr	Cornell University	United States of America
40079	37	49	37	49	There is no evidence of a stronger tole of the private sector in CDM market as regulation has been strengthened. See Michaelowa et al. (2019). Michaelowa, Axel; Shishlov, Igor; Brescia, Dario 2019 Evolution of international carbon markets: lessons for the Paris Agreement, in: WIREs Climate Change, 10, e613, DOI: 10.1002/wcc.613	noted. Text will be adapted to be clear it is not saying FMD tools are the only trend	Axel Michaelowa	University of Zurich	Switzerland
21769	37	5			Humphreys, 2016)	noted.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
3433	37	6			been	noted.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
6847	37	14			"Cashore, Visseren-Hamakers, et al. 2016" Please cite properly.	noted.	Valasia Iakovoglou	International Hellenic University	Greece
21771	37	14			cek refernces: (Humphreys et 14 al. 2017, Cashore, Visseren-Hamakers, et al. 2016).	noted.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
22695	37	15			Example 3 does not link well to C cycling. How does this example with hunting prevent C emissions? A better example in Canada would be to discuss forest management to reduce wildfire risk to reduce C emissions. A much bigger player in C cycling than mammals causing soil disturbance.	Good point. Will adapt	Melissa Lucash	Portland State University	United States of America
47677	37	17			What does "punctuated up" mean?	noted	raphael Slade	Imperial College	United Kingdom (of Great Britain and Northern Ireland)
22689	37	18			Don't need to capitalize the animal names.	noted	Melissa Lucash	Portland State University	United States of America
21773	37	19			Schmitz, 2015	noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
22691	37	19			Soil, not soild	noted	Melissa Lucash	Portland State University	United States of America
22693	37	20			Omit the "however" since that has nothing to do with moose.	noted	Melissa Lucash	Portland State University	United States of America
22697	37	24			The names are somewhat offensive drawing attention to hunters as "Baptists" and local managers don't want to be called "street level" bureaucrats.	These are common terms in the literature, but noted	Melissa Lucash	Portland State University	United States of America
21775	37	30			Schmitz, 2019	noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
10451	37	37			There is a notable absence of discussion of enables and barriers for agriculture GHG policies - almost all is about forestry. There are positive examples, but also it would be possible to spend some time assessing literature that may help explain the spectacular failure of agricultural GHG policies to date. A key issue that is missing is leakage (this is addressed on page 33 but is too limited in scope there), and also the role of trade and competing narratives about supporting local food production vs globally emissions-efficient food production - which could usefully link back to any earlier statements/conclusions that section 7.3 could make on regional and farm-system differences in emissions intensity, but also the dual role of trade in smoothing out but also accentuating supply shortages and price spikes.	Thanks for comment. Will include additional discussion of agriculture in SOD	Andy Reisinger	NZAGRC	New Zealand
21777	37	39		50	which part of indonesia this study was conducted?please specify	Noted. Will address in SOD	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
6895	37	46			"Bäckstrand, Kuyper, Linnér, & ..." I believe that we use "and" instead of "&". If so, please also chech page 38.	Thanks.	Valasia Iakovoglou	International Hellenic University	Greece
32877	38	2	38	30	With the described barriers, it would make funders be wary of the issues such as permanence	Noted. Will address in SOD	Cheah Singfoong	Independent consultant, formerly more than 10 years with the National Renewable Energy Laboratory, USA	United States of America
9823	38	27	38	27	Explain FLEGT at first occurrence in the text.	Noted and thanks.	Jeanne Bormann	Ministry of agriculture	Luxembourg
17281	38	27	38	27	Move explanation of FLEGT here from line 36.	Noted. Will revised discussion in SOD	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany
41761	38	30	38	30	space missing before bracket.	Thanks.	Cecile Girardin	University of Oxford	United Kingdom (of Great Britain and Northern Ireland)
24483	38	33	38	45	Myanmar submitted its FREL to UNFCCC in 2018 which express REDD+ initiatives as a contribution to the green development of Myanmar as well as supporting the mitigation of, and adaptation to, climate change. The national REDD+ Programme is critical to address Myanmar's climate change mitigation and adaptation actions. (Ref: Myanmar's FREL, 2018).	Noted.	SAN WIN	Environmental Conservation Department, Ministry of Natural Resources and Environmental Conservation	Myanmar
17283	38	47	38	55	Please expand this paragraph. Adaptation and mitigation actions and programmes are also often hindered by existing trade or subsidies schemes or land-use governing laws (agriculture, nature conservation, ...).	Thanks. Good point to be addressed in SOD	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
46309	38	48	38	52	While it is recognised that only seeking co-benefits of mitigation and adaptation is an institutional barrier to the success of REDD+, this is the approach taken by the chapter. The chapter focus in mitigation and relegates adaptation to a small section. There is no integration between mitigation and adaptation. In the land use sector, mitigation and adaptation occur in the same land, therefore one should not be thought without the other. The approach of treating mitigation and adaptation separately is obsolete in the case of the land use sector.	Noted. We will include some additional discussion of adoption and references to WG II	Diana Feliciano	University of Aberdeen	United Kingdom (of Great Britain and Northern Ireland)
19705	38	53	38	53	Another aspect of institutional complexity is the different climate and non-climate values as well as the public and private financial means involved in the architecture and implementation of REDD+ and other initiatives (Zelli et al., 2017).	Noted.	Mochamad Indrawan	Research Center for Climate Change - Universitas Indonesia (RCCC-UI)	Indonesia
19707	38	55	38	55	woukd it worh outlining as had been done by Zelli et al (2017), e.g. social and cultural dimensions (livelihoods, spiritual values, recreation), economic dimensions (wood, non-wood products) and ecological dimensions (biodiversity conservation)	Thanks.	Mochamad Indrawan	Research Center for Climate Change - Universitas Indonesia (RCCC-UI)	Indonesia
48111	38	8			it is suggested to include women's access to land problems that prevent them from participating in forest programs	Thanks. Will include additional discussion about distributional issues.	Verónica Gutiérrez Villalpando	Consejo Nacional de Ciencia y Tecnología comisionada en el Colegio de Postgraduados	Mexico
29525	38	10			Antwi-Agyei, Dougill, & Stringer, 2015; Two articles with the same author and year in the reference	Thanks	RAEHYUN KIM	Institute	Republic of Korea
21779	38	19			seven countries ? Please mention	Thanks. Will revise in SOD	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
17793	38	27		37	In line 27 "Forest Law, Enforcement, Governance and Trade (FLEGT) and REDD+..." but then put only FLEGT in line 36.	Thanks. Noted	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
47679	38	27			Spell out FLEGT stands for " Forest Law Enforcement, Governance and Trade"	Thanks. Noted	raphael Slade	Imperial College	United Kingdom (of Great Britain and Northern Ireland)
42433	38	30			This could be added after line 30 along with the refernce: Furthermore, the review of implementation of REDD+ project across the globe suggests that issues related to MRV are key constraints to implementation of REDD+. This challenge has hindered establishment of a universal framework for implementing the REDD+ project, and thus assurance of a fair and equitable benefit sharing mechanism. In this regard, strengthening existing institutional setups related to management of forests of a country may help overcome bottlenecks to development of a framework for REDD+. This would not only help country like India to benefit from international market/ mechanisms, but would also help create a robust monitoring mechanism for forest governance at all scales, from villages to the national level (Sinha, 2017). Sinha, B. 2017. Benefit Sharing Mechanisms under REDD+: Learning from the Joint Forest Management Program. In Managing Forests in a Changing Climate: Emerging Concepts and their Operationalization, US AID, 233- 253	Noted.	Bhaskar Sinha	Indian Institute of Forest Management	India
21781	38	39			re-write:REDD+(Tegegne et al., 2014) .	Thanks.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
17795	38	40		41	(Somorin et al, 2016)... When more than two authors are listed.	Thanks	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
12241	39	6	39	8	What about the involvement of public bodies and stakeholders? They should have some engagement in.	Noted. Will be addressed in SOD	Mohammad Ibrahim Khalil	University College Dublin	Ireland
32031	39	11	39	11	phrase: 'subnational levels(Morrison et al., 2017' needs a space before the parenthesis	Thanks	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
19709	39	15	39	16	"Forest policies under the REDD+ programs are in many cases embedded within established hierarchies of centralized control and state ownership of forest land (W. D. Sunderlin et al., 2016)."	see next comment	Mochamad Indrawan	Research Center for Climate Change - Universitas Indonesia (RCCC-UI)	Indonesia
19711	39	15	39	16	to the statement above there could be consideration for further devolution of governing authorities, e.g. Indonesia's evolving social forestry including the full transfer of rights through the customary forest tenurial system (Fisher et al 2018; Fisher et al 2019)	Noted. Issues of devolution of REDD+ governing authority will be addressed in SOD	Mochamad Indrawan	Research Center for Climate Change - Universitas Indonesia (RCCC-UI)	Indonesia
19713	39	15	39	16	Fisher, M. R., Moeliono, M., Mulyana, A., Yuliani, E. L., Adriadi, A., Judda, J., and Sahide, M. A. K. 2018. Assessing the new social forestry project in Indonesia: recognition, liveihood and conservation?. International Forestry Review, 20(3), 346-361.https://doi.org/10.1505/146554818824063014	Thanks	Mochamad Indrawan	Research Center for Climate Change - Universitas Indonesia (RCCC-UI)	Indonesia
19715	39	15	39	16	Fisher, M.R., Dhiaulhaq, A., Sahide, M.A.K., 2019. The politics, economies, and ecologies of Indonesia's third generation of social forestry: An introduction to the special section. Forest Soc. 3 (1), 152. https://doi.org/10.24259/fs.v3i1.6348	Thanks	Mochamad Indrawan	Research Center for Climate Change - Universitas Indonesia (RCCC-UI)	Indonesia

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
28999	39	32	39	32	Don't forget to add the "barrier" too, to make it consistent with the passages before it.	Thanks	Marissa Malahayati	National Institute for Environmental Studies	Japan
44937	39	32	39	33	There is a paragraph planned here with the title 'Safeguards (social and environmental) successes'. It is pivotal that the chapter addresses safeguards. But why focusing on 'successes'? A major problem with REDD+ is that the safeguards are too vague and that they have not been able to actually safeguard against negative consequences experiences by indigenous people and people living in poverty.	Agreed. Will be addressed in SOD	Hanne Svarstad	OsloMet - Oslo Metropolitan University	Norway
41763	39	33	39	33	Replace placeholder	Agreed. Will be addressed in SOD	Cecile Girardin	University of Oxford	United Kingdom (of Great Britain and Northern Ireland)
26895	39	35	39	35	The front section of 7.5 is also a rehash of the SRCCL. The authors need to say something new. There is no IPCC uncertainty language throughout. Please make this an assessment and point to policy relelvant conclusions throughout.	Noted and accepted. The SOD will clarify SRCCL findings and new findings as well as add uncertainty language	Louis Verchot	International Center for Tropical Agriculture	Colombia
40381	39	37	39	37	management pratices conjuction with polical, educatinal	Accepted	Gunta Kalvane	University of Latvia	Latvia
12243	39	37	39	39	In addition to other subsections/sentences, forests, wetlands, grasslands, and agricultural lands should be repalced by "forest, wetlands, croplands, grasslands and other agricultural lands'	Accepted	Mohammad Ibrahim Khalil	University College Dublin	Ireland
27321	39	37	39	44	In this introduction to the subchapter, an introduciton of the basic principle is required, as outlined in AR5: assessment of mitigation potentials have to be assessed against a counterfactual without mitigation activities. Otherwise, ongoing trends are interpreted as being part of the mitigation activity.	Accepted	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
32907	39	38	39	38	I would suggest to refer to 'the land system' here instead of listing different ambiguous land-cover/land-use classes that might not have strict definitions.	Accepted	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
5079	39	41	39	41	Consumer……consumer	Accepted. Editorial	Sayed Masoud Mostafavi Darani	Iran Meteorological Organization	Iran
12245	39	41	39	44	How come SOC sequestration is enhancing water quantity? At least I am not clear!	The sentence refers to land-based activities more broadly (e.g. reforestation and reduced deforestation can enhance water quantity)	Mohammad Ibrahim Khalil	University College Dublin	Ireland
2943	39	46	39	49	Need more number of citations: Since the AR5, there have been numerous new global assessments of 'bottom -up' mitigation potential 47 (climate impact of a single practice) (Roe et al. 2019; Fuss et al. 2018; Griscom et al. 2017; Smith et 48 al. 2016) as well as 'top -down' mitigation potential	We will add some newer studies from 2019 and 2020. Note that this list includes the studies highlighted in the SRCCL, and are reviews of global land-based mitigation potential, not of individual activities.	Adnan Arshad	China Agricultural University	China
32909	39	46	39	50	While I think I understand what's the intention of this statement, I think it's misleading, as also the 'bottom-up' assessmentes consider various practices (though not necessarily interactions between them). Why not differentiate along the line of 'spatial/data analysis' vs. 'model-based' assessments?	Noted. We revised the definitions	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
41765	39	47	39	48	Missing reference: Griscom et al., 2020, Philospohical Transactions of the Royal Society B	Accepted	Cecile Girardin	University of Oxford	United Kingdom (of Great Britain and Northern Ireland)
27323	39	46	40	15	Either here, or below inthe passages related to restoration, re-afforestation: the results of the study by Bastin et al. 10.1126/science.aax0848, should be referred, including an assessment of the many comments, affirmations and critiques (10.1126/science.aay7976, 10.1126/science.365.6448.40-c, 10.1126/science.aaz0388, 10.1126/science.aay8060, 10.1126/science.aax9539, 10.1126/science.aay8108, 10.1126/science.aaz0705, 10.1126/science.aay7988). This should be contextualized with the findings on restoration potentials in e.g. 10.1038/nature25138, 10.1111/gcb.13876, etc.	Accepted, A/R subsections will address in SOD	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
18159	39	35	42	7	Difficult to assess, given that the authors announce many new things to be introduced in the next version. At present, this is still far from usual standards for an assessment, everything just based on a couple of studies (mainly Roe et al. 2019 and Griscom et al. 2017) which seem arbitrarily chosen and are renarrated. At least, it is not visible why this lliterature was chosen, how it was assessed against different articles, etc. This may be okay for a ZOD but not at the FOD stage	Noted, this section will be revised in the SOD	Helmut Haberl	Institute of Social Ecology, University of Natural Resources and Life Sciences, Vienna	Austria
38713	39	35	42	8	General on global estimations: It will be desirable to introduce some sentences indicating that the global estimates can not capture the glanurality of the complexity a lower scales, in potential land to be use for certain parcticies (for example for Afforestation/Reforestation, we know Griscom estimations are by far too hihg and comletly unrealistic for mediterranean countries duee to the simplification of the assumptions - such as land available and C sequestration rates)	Noted and accepted, we will add distinction between global vs regional estimates	Maria Jose Sanz Sanchez	Basque Center for Climate Change	Spain

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
6251	39	35	54	20	Now is the time we have to reserch novel methdology for climate change.	thank you, noted	Seokhwan Jeong	Kongju National University Graduate School	Republic of Korea
28455	39		62		Chapter 7 provides a good, comprehensive overview on drivers, trends and mitigation options relating to AFOLU (Agriculture, Forestry, and Other Land Uses). However, it may pay more attention to the effects of other forms of sustainable agriculture, especially the agroecological approaches, that have been shown to have positive effects in terms of climate change mitigation and adaptation. Moreover, it might be useful to highlight the linkages between consumption and production as well as the feedback loops between them within Sustainable consumption and production approaches. As for demand-side measures, authors might make reference to some specific examples of 'sustainable diets' such as the Mediterranean diet and the New Nordic diet.	accept, we will consider, we agree a better repr of diet changes is warranted	Hamid El Bilali	International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM-Bari)	Italy
12723	39	35	63	9	would be great to discuss not only the mitigation potential of measures, but also the feasibility of these measures: to what extent are there (regional) instituitonal, technical, economic, behavioural etc barriers that reduce the likeliness of the implementation of the proposed measure. The IPCC SR1.5 report did this for a number of specific system transitions (chapter 4, page 383, table 4.11), but could be done for the options discussed in this section of the chapter. Several of the WG2 chapters are conducting similar excersises (conducting feasibility assessments of adaptation options)	accept, a feasibility process is set up under SOD	Robbert Biesbroek	Wageningen University	Netherlands
20667	39	35	63	9	I like that this section goes through major mitigation measures in line, providing a lot of information in the process. However, many pages of information leave the reader dizzy with information and none-the-wiser concerning the "global" mitigation potential and what it depends on. Crucially, what is not shown in figure 7.16 is that the potentials are no additive as they may interfere with eachother. To the best of my knowledge there isnt a published systematic analysis of "integrated" mitigation potential acocunting for all of these measures, but it would be helpful to at least highlight the tradeoffs clearly. Suggestion: A "synthesis" figure or table, presenting each mitigation measure and highlighting: Pros; cons; trade-offs; synergies (with other measures?); costs; mitigation potential; regional variation; others?? This could act as a central point for highlighting the potential and complexity of land based mitigation and offer a ton of information in a concise manner, with the individual sections going into the details.	accept, section (new 7.4) will have major rewrite	Vassilis Daioglou	Copernicus Institute of Sustainable Development	Netherlands
38723	39	35	63	9	Section 7.5: a table with a clear introduton of the taxonomy and definitions of the mitigation optios will be very usesul. Introducing clear explanations in the text when using the different papaers de differences with the taxonomy used in the chapter. How it relates to the SRCCL chapter 7?. I will recomend to avoid the use of the term Avoided Deforestation and use only reduced deforestation.	accept, section (new 7.4) will have major rewrite	Maria Jose Sanz Sanchez	Basque Center for Climate Change	Spain
38729	39	35	63	9	In the past and trends section there is some reguional estimates. While in this section regional estimates are not provided. There are several metanalysis form the mediterranean proactices that povive interesting information (for examples Sanz-Cobeña et al 2017 in Agriculture, Ecosystems and Environment)	accept, section (new 7.4) will have major rewrite	Maria Jose Sanz Sanchez	Basque Center for Climate Change	Spain
3435	39	3			provides	editorial. Will address in SOD	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
21783	39	11			space:levels(Morrison	Noted.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21785	39	12			six countries? Pls mention	restructuring section and will address in SOD	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
6849	39	16			(W. D. Sunderlin et al., 2016) OR change to (Sunderlin et al., 2016)	editorial. Will address in SOD	Valasia Iakovoglou	International Hellenic University	Greece
21787	39	32			Safeguards (social and environmental) successes ???still empty?	will be improved and included in SOD	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
3437	39	33			the section is empty	will be improved and included in SOD	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
618	39	35			For Section 7.5, on assessment of AFOLU measures, it could be relevant to point to recent considerations of "hidden emissions" associated to forest regrowth. Hidden emission are emissions arising elsewhere caused by socio-economic processes associated to forest regrowth, for example, emmissions from agricultural intensification required to spare out areas for forest regrowth, emissions from woodfuel subsitution by fossil fuels, etc. While these processes relieve pressure on forests, they create new emissions elsewhere, and might be particularly relevant over the long term, compromising mitigation. These processes can be related to leakage (when forests are cut down elsewhere, sometimes in other countries and thus hard to be tracked), but go beyond what so far has been discussed under leakage, involving more complex socio-economic processes. There is growing research on this, but this is also still a knowledge gap. References: - Gingrich, S., Lauk, C., Niedertscheider, M., Pichler, M., Schaffartzik, A., Schmid, M., Magerl, A., Le Noë, J., Bhan, M., Erb, K., 2019. Hidden emissions of forest transitions: a socio-ecological reading of forest change. Curr. Opin. Environ. Sustain. 38, 14–21. https://doi.org/10.1016/j.cosust.2019.04.005 - Scheidel, A., 2018. Carbon stock indicators: reductionist assessments and contentious policies on land use. J. Peasant Stud. https://doi.org/10.1080/03066150.2018.1428952	Accept, whole section 7.5. is in total rewrite	Arnim Scheidel	Institute of Environmental Science and Technology (ICTA), Autonomous University of Barcelona (UAB)	Spain
10453	39	35			This section should draw much more extensively and explicitly on the SRCCL - summarise for each option what the SRCCL (and SR15, and AR5) have said about it - and then be clear where you are evaluating more recent literature (and whether this lit confirms or modifies the existing conclusions), or where you are taking an angle or issue that wasn't covered in previous assessments and hence by definition is new and different. As it stands, much of this section covers existing ground but without making the above points clear. Also, much of the discussion is more a literature review than an assessment - where there are contrasting findings in the literature, what is your conclusion, and at what level of confidence (and why at that level of confidence)? For exanple, it would be good to have an assessment/scrutiny of Roe et al before using it more or less as the default numbers in this assessment (and clarify whether this changes in any way the conclusions from previous assessments please). Also for all mitigation potentials it is critical to provide the relevant carbon prices or make clear that something is a technical potential (which in most cases will then need some interpretation to make it policy relevant, since technically all sorts of things are possible that are entirely unrealistic in the real world)	Accept, whole section 7.5. is in total rewrite	Andy Reisinger	NZAGRC	New Zealand
10485	39	35			I'm missing a section on emerging mitigation options - I think this belongs here (especially as some mitigation options are already going through pilot phases), it can't be just shifted into section 7.6 or 7.7.4 as they are part of a continuum of options with varying levels of readiness for implementation. E.g. some existing options, covered in 7.5, can not yet be used in all regions - but that doesn't mean they should be treated as 'future option' either. What section 7.7 should then do though is look at agriculture specific initiatives and work to accelerate technological development and deployment, to enhance productivity and develop new mitigation options - the role of government collaboration, finance etc (check with chapters 15 and 16 on the extent to which they are treating agriculture / forestry explicitly)	Accept, but new technologies is a section to be developed	Andy Reisinger	NZAGRC	New Zealand
21789	39	40		41	(some words still capitalized): Agriculture, Forests and other ecosystems, Bioenergy and other land-based energy technologies, and Consumer behaviour.	Accepted. Editorial	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
22699	39	41			Add “large” before scale.	Accepted. Editorial	Melissa Lucash	Portland State University	United States of America
29605	39	44			Francis et al 2016; Add this article to the reference	Accepted. Editorial	RAEHYUN KIM	Institute	Republic of Korea
29801	39	44			Toensmeier et al. 2016; Add this article to the reference	Accepted. Editorial	RAEHYUN KIM	Institute	Republic of Korea
21791	39	53			(some words still capitalized):Special Report on Land	This is referring to the IPCC SRCCL, revised to make clear	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
10517	39				I suggest the authors re-structure this section into (a) individual interventions, (b) farm/landscape system interventions (which typically deploy a specific subset of the individual interventions - define and clarify which ones for each system type intervention (as this is not always clear or defined) and the extent to which the individual interventions are additive or not, (c) demand-side interventions (for agriculture - i.e. reducing demand for emissions-intensive activities), and (d) increasing supply of biomass for sequestration (primarily bioenergy, and wood for construction). This would in my view give a more logical structure and avoid overlaps. For biomass, the authors need to consult with other chapters to clarify what it is that this chapter assesses and what is done by others. Right now this seems very unclear and there is no real conclusion at all on biomass (scale, trade-offs, feasibility etc) from this chapter.	accept, a full rewrite is planned for SOD	Andy Reisinger	NZAGRC	New Zealand
38709	40	4	8	40	This statement is to simplistic, this is assuming the present vulnerability of the excosystems and olmost no barriers, and with out taken into accoun the need to prioritaize ofther services than carbon in certain geographic areas which may end up with the need to select the less carbon optimal options to protect biodiversity of non forest systems for example. Please make sure this cabeats are included.	Accepted, we will clarify caveats and uncertainty	Maria Jose Sanz Sanchez	Basque Center for Climate Change	Spain
17297	40	4	40	5	Please keep in mind that the estimates from global analyses like Griscom et al. have a very large uncertainty associated with the numbers provided. Writing "can" here is very bold.	Noted, wording was revised	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany
41767	40	4	40	5	I am concerned that this statement is dated. "Land-based mitigation can deliver about 30% of global mitigation between 2020-2050" At a minimum, please replace "about" with "up to", and perhaps add that this estimate is being revised to apply tighter constraints to the estimate. Please check with Bronson Griscom if possible. His latest work (Griscom et al., 2020; Bush et al., 2019) have more realistic model contraints. I am currently working on a paper with B. Griscom looking at a lower estimate of the contribution of NbS to global mitigation. Could you please let me know where I should send our publication to make sure this is updated when it is published? contact me on cecilegirardin@gmail.com	Noted, we revised text to clarify and provide more context	Cecile Girardin	University of Oxford	United Kingdom (of Great Britain and Northern Ireland)

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
27627	40	4	40	21	Are the carbon capture results of climate-smart villages included in the estimates? It looks like there is first a general estimate and then individual results. Existing best results should really be extrapolated to the whole Earth soil surface , 2 or 3 best techniques could even be additive	Noted. The agroforestry and soil carbon sequestration sections were re-written and provide more regional context. Climate smart villages will be considered for a box that covers umbrella terms like organic agriculture, etc.	Dorota Retelska	Independent	Switzerland
38633	40	6	40	7	The main objective of forest management is considered as "sustainable use of forest". Of course a part of land tenure of forest management includes promoting regeneration, but avoiding deforestation maybe another policy. Thus, example in a bracket is better including "sustainable management (use) of forest.	Noted, removed 'management'	Atsushi Sato	Mitsubishi UFJ Research and Consulting Co.,Ltd.	Japan
32911	40	6	40	8	Statement too simplified. Forest management not always the cheapeste and easiest and agricultural activities not necessarily expensive (see e.g. soil carbon sequestration discussed later on and advertised as 'low-cost and large-scale' mitigation option).	Noted, will revise to clarify and add nuance	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
40299	40	9	40	10	Many countries in SSA are still struggling with aspects of food security especially how to increase the quantity of crops produced for food. These aspects may compromise the political will, available finance and governance capacities	Noted, will add link from mitigation actions to implementing other goals (e.g. food security)	Barnabas Msongaleli	University of Dodoma	United Republic of Tanzania
41791	40	10	40	10	Please add information on the proportion of NCS potential coming from protection vs improved land management vs ecosystem restoration (Grisom et al., 2017), to make the point that most of this mitigation potential can be achieved through protecting natural ecosystems and improving the land management of agricultural lands - eg. agroforestry	Accepted	Cecile Girardin	University of Oxford	United Kingdom (of Great Britain and Northern Ireland)
41769	40	11	40	11	Please add information on National mitigation potentials from natural climate solutions (Griscom et al., 2020). The study provides insights on which land based mitigation pathway woul dbe most successful in different tropical countries.	Accepted	Cecile Girardin	University of Oxford	United Kingdom (of Great Britain and Northern Ireland)
38711	40	11	40	13	I guess that then the question is … if this true why through REDD+ we didi not achieve more and is being so difficult so far? Usually we fail in including real overall cost which is difficult to estimate at global scales. Could you expand on this?	Accepted, will expand and clarify limitations of economic assessments	Maria Jose Sanz Sanchez	Basque Center for Climate Change	Spain
41793	40	14	40	14	Cite Griscom et al., 2020, Bush et al. 2019	Accepted	Cecile Girardin	University of Oxford	United Kingdom (of Great Britain and Northern Ireland)
2641	40	17	40	21	Table 7.4: you might consider above ground carbon sequestration. It seems that the corresponding carbon fluxes are far from negligible, as reported by Lei Fan et al, " Satellite-observed pantropical carbon dynamics", nature plants, DOI /10.1038/s41477-019-0478-9.	Carbon sequestration estimates are included in 'forest & other ecosystems' as well as 'agriculture'	Philippe Waldteufel	CNRS/IPSL/LATMOS	France
17285	40	17	40	21	Please explain what you consider to be the "technical potential". Does this e.g. include e.g. limitations in seed availability or planting techniques as well? And please specify what you mean by "cumulated over price ranges". Does this mean that there is hardly any increase in potential if the price increases from 'below 20$' to 'above 20$, but below 50$'?	Accepted, the table will be revised with additional data, analysis and definitions	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany
29001	40	17	40	21	I don't understand the value inside the table and the meaning of the header of each column. Please explain more about it.	Accepted. In the SOD, the table will be revised with additional data, analysis and definitions, and all values will be clarified	Marissa Malahayati	National Institute for Environmental Studies	Japan
30899	40	17	40	21	There are some smaller scale, lower cost BECCS option at or slightly below the $50/tCO2 threshold, e.g. ethanol fermentation and black liquor gasification, see e.g. McLaren 2012. A comparative global assessment of potential negative emissions technologies. Process Safety Environ. Protect. 90, 489–500.	Accepted. In the SOD, the table will be revised with additional data	Jasmin Kemper	IEA Greenhouse Gas R&D Programme (IEAGHG)	United Kingdom (of Great Britain and Northern Ireland)
37445	40	17	40	21	Can anything be added about the assumptions behind these numbers? E.g. what scale of land-use change would be requred?	Accepted. In the SOD, the table will be revised with additional data and assumptions will be clarified	Michiel Schaeffer	Climate Analytics	Netherlands
12247	40		40		Table 7.4. It is suggested to provide range values as <100/t CO2-eq included here also represents 50, 20 and 0.	Noted, we will revise the table and clarify	Mohammad Ibrahim Khalil	University College Dublin	Ireland
17797	40	17		17	GtCO2eq not GtCO2e. But in the table units shown are t not Gt. Correct what units are.	Noted, editorial.	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
21793	40	17			Table 7.4 title is too long and the content of table is difficult to undestand	Accepted. Title was revised and the content clarified	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
43297	40	19			in legend: 'cumulated' might be better as 'summed'	Accepted	Deborah Lawrence	University of Virginia	United States of America
3439	40	20		21	In the table 7.4 the unit for CO2 emissions (CO2-eq) have not the same format than in the previous text (CO2e). Harmonization would be welcome.	Noted, editorial revision.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
9477	41	0	41	0	regarding the reduce emissions from agriculture, I wonder the reliability of "Reduced N2O from manure on pasture" and "Manure management on N2O and CH4". There were several synthesis studies (e.g., Zhou et al. 2017 Global Change Biology 23: 4068-4083; Owen et al., 2015 Global Change Biology 21: 4533-4547) have demonstrated that manure application do increase N2O emissions relative to mineral N fertilizer from agricultural soils. I suggest to further analysis the aspect on N2O emission mitigation of manure application in agricultural production systems.	Noted. Will address this in the manure mgmt section re-write	Minghua Zhou	Institute of Mountain Hazards and Environment, Chinese Academy of Sciences	China
11299	41	0	41	1	Can you make this figure simpler and readeable?? Very difficult to understand anything from the figure, too many references and very small dots and number only a specialist can understand	Accepted. Will convert figure into a table for enhanced clarity	Mahmood Riyaz	Maldivian Coral Reef Society	Maldives

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
17091	41	1	41	14	The (otherwise excellent!) paper by Roe et al also refers to the Drawdown (ref. 45 in the figure) report for various options. I would be cautious here. It gives results for a longer time period (2020-2050) and I found it difficult to trace back their findings to the sources they quote (for most options, they give a variety of sources).	Noted. Revised estimates and detailed methods were published by Project Drawdown in early 2020 and are updated in our database and figure/table.	Kornelis Blok	Delft University of Technology	Netherlands
17287	41	1	41	14	Please revise this table and heed the definition of forest management in the IPCC and FAO literature. This means, distinguish afforestation (of previously not-forestes lands) from reforestation (on lands that previously have been covered by forest, see chapter 7.5.1). Thus, reforestation is part of forest management. Unfortunatelly, this is misunderstood and confused in much of the literature, not only Roe et al. cited here. Besides: the minority of the papers cited here with regard to forests concern mainly agriculture and / or only REDD / REDD+. Please add some references that truly concern forests around the globe.	Noted. The figure will be converted into a table for enhanced clarity. On the issue of reforestation and afforestation definitions, the A/R section will be thoroughly revised, please see response in that section that UNFCCC definition will be used.	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany
29003	41	1	41	14	I don't understand the function of Figure 7.16, what is the relation with the section? And the references… which references? The figure also too small. The caption also too long and need to be summarized and to the point. Consider to re-draw it in the next draft	Noted, the figure will be converted into a table for enhanced clarity, and the caption revised	Marissa Malahayati	National Institute for Environmental Studies	Japan
12249	41		41		Figure 7.16: Some methodological clarficiations would be beneficial as the SOC sequestration in croplands and BECCS deployment seems overstimated.	Noted, will provide clarification on methods	Mohammad Ibrahim Khalil	University College Dublin	Ireland
37447	41		41		Is this figure already included in the SRCCL?	The figure was included in the SRCCL, and updated to include new data for the AR6. This figure will be converted into a table to add further data and information for enhanced clarity.	Michiel Schaeffer	Climate Analytics	Netherlands
3441	41	2			It is the same in the figure 7.16	Unclear comment	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
5917	41	2			References listed on right of figure 7.16 are meaningless. Need to put in IPCC format and add to chapter ref list - or delete.	Accept, figure is now a table, and references have been revised	Ralph Sims	Massey University	New Zealand
6851	41	6			"We only include references that explicitly…" I would suggest using passive voice.	Editorial. Copyedit to be completed prior publication.	Valasia Iakovoglou	International Hellenic University	Greece
21795	41				Figure 7.16 title is too long and difficult to undestand	Accept, title has been revised	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
39785	41				Figure 7.16 is very hard to read as it is so small. Could there be one figure for land management and one for demand management?	Accepted. Will convert figure into a table for enhanced clarity	David Manning	Newcastle University	United Kingdom (of Great Britain and Northern Ireland)
48143	41				Does not consider enhanced weathering of crushed rock application as an agro forestry intervention. Needs to be cited here as has Co benefits	Noted. We will add note about emerging and novel technologies, however, these activities are covered in another section	Andrew Lockley	Andrew Lockley	United Kingdom (of Great Britain and Northern Ireland)
11301	42	0	42	1	Can you include islands seperately, here you have pacific caribean etc included still need to definf developing pacific??	Reject. The regions are based on the IPCC specified regions for all chapters	Mahmood Riyaz	Maldivian Coral Reef Society	Maldives
17289	42	1	42	7	Please revise this figure. Check whether "reforestation" is truely reforestation (then it should be renamed to forest management and contributions from other FM activities added) or whether this is confused with afforestation. In addition, if "natural forest management" is taken from Griscom et al., they refer to the management of natural forests (see supplementary information of the paper), what alsoconstitutes a change in land use from non-used to managed forests, but the expression used here is sometimes mistaken for "forestry close to nature". Please amend the text to clarify this issue.	Noted. We refer to the definition in the UNFCCC glossary, and the A/R definition adopted in SRCCL, and will clarify this in the legends.	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany
46523	42	3	42	7	Figure 7.17: Why is dietary change not included as one of the key land use changes, given the impact on enteric fermentation, grazing land etc?	Data on mitigation potential of diets by region was not available at the time of FOD, however, data has recently become available and will be included in SOD	Rachel Bezner Kerr	Cornell University	United States of America
32913	42	12	42	14	As the 'international conventions and national policies' are taken up at several instances througout this section, it would be usufel to include a box where they are explained/summarized in bit more detail.	partly accept, we will improve the policy part, and also merge with the Bx by Ben Cashore, however a extra box is not possible	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
17291	42	16	42	29	Please remember that the definitions cited here are strictly only applicable in the context of the Kyoto Protocol, not generally for "UNFCCC". They are part of an accounting framework and the 50 years period to distinguish afforestation from reforestation is an bureaucratic agreement, as also the reference to the year 1989 with reforestation. Generally, in the field of science touched here (forest sciences, forestry), the difference between afforestation and reforestation is that the first is also a change in land use, whereas the latter is not. Reforested areas may have been without tree cover for years, but they may not have been used for e.g. agriculture. If you want to apply the definitions from the KP throughout this report, please put a respective remark at a prominent and early place. If you want to follow the general use as e.g. also used by FAO, please revise the definition here.	reject, we stick to the UNFCCC glossary	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
38635	42	16	42	29	The definitions of Aforestation and reforestation referred here is not UNFCCC definition, but definition applicable to the LULUCF accounting rule under the Kyoto Protocol. It is misreading to refer those definition like a general definition decided by the UNFCCC. At least the text like "for example under the Kyoto Protocol" is essential here	accept we stick to the UNFCCC glossary	Atsushi Sato	Mitsubishi UFJ Research and Consulting Co.,Ltd.	Japan
43349	42	16	42	40	I suggest to consider simpler definitions, the Marrakesh Accord is now “past” – these definitions were valid under KP, not under Paris. In the glossary of SRCCL these simpler definitions were adopted Afforestation: Planting of new forests on lands that historically have not contained forests. Reforestation: Planting of forests on lands that have previously contained forests but that have been converted to some other use. Agree to note that “they may have very different ecological implications“	accept we stick to the UNFCCC glossary	Giacomo Grassi	Joint Research Centre, European Commission	Italy
32915	42	23	42	24	Not useful to mention 'very different ecological implications' of afforestation in differenct ecosystems without any details. At least a reference required.	accept, we will specify better	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
42695	42	23	42	24	Great point. Would be nice to briefly state what the different ecological implications are.	accept, we will specify better	Eromose Ebhuoma	University of South Africa	South Africa
25769	42	31	42	40	This paragraph omits important considerations for afforestation planning: e.g. negative impacts on biodiversity (Bond, W.J. et al. 2019. The trouble with trees: afforestation plans for Africa. Trends in ecology & evolution, 34(11); Abreu, R.C. et al. 2017. The biodiversity cost of carbon sequestration in tropical savanna. Science advances, 3(8)), potential for reduced below-ground carbon storage under forests vs grassland (Dass, P. et al. 2018. Grasslands may be more reliable carbon sinks than forests in California. Environmental Research Letters, 13(7))	accept, we will specify better	Helen Hughes	University of Edinburgh	United Kingdom (of Great Britain and Northern Ireland)
12075	42	33	42	33	There is no literature reference for albedo here - is this article relevant https://www.mdpi.com/2072-4292/11/7/871?	Accept, we will have a CA on albedo, VOCs and physical effects	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
43301	42	33	42	35	this might be a place where a figure that shows the biophysical (albedo+roughness+evapotranspiration) effects of forests at different latitudes (Davin and Noblet-Ducoudre 2010) or a figure with BOTH biophysical and carbon effects of forests (our paper: Lawrence et al, in review)	Accept, we will have a CA on albedo, VOCs and physical effects	Deborah Lawrence	University of Virginia	United States of America
30539	42	35	42	35	Lewis et al (2019) is not included in the reference list	Editorial. Copyedit to be completed prior publication.	Richard Betts	Met Office Hadley Centre	United Kingdom (of Great Britain and Northern Ireland)
32917	42	35	42	35	Lewis et al. (2019) missing in the reference list.	Editorial. Copyedit to be completed prior publication.	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
32919	42	35	42	36	Any details on the contents of the 'Bonn Challenge and other schemes' planned for SOD? Would suggest to at least include a reference to the texts to guide the interested reader.	accept, ref to be added	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
38715	42	35	42	38	Be aware that many of the Bonn Challenge commitements where political declaration that may be far form being realistic. And even assuming that natral regeneration is the cheapest, whaich I sahere, are the data we have so far good enougn… I do not think so, there may be more potential than estimated .	accept, we will reflect upon all the afforestation plans with the ins and outs	Maria Jose Sanz Sanchez	Basque Center for Climate Change	Spain
17295	42	35	42	40	Lewis et al. (2019) is not included in the references, please add.	accept, editorial	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany
12073	42	36	42	40	Is Lewis et al. 2019 this article: https://www.nature.com/articles/d41586-019-01026-8 ? Not in the reference list. Regarding the statement "Natural regeneration is the cheapest and technically easiest option." - this statement is not necessarily true; the land can be degraded to the extent that it will not recover by itself, and planting is the only option. Also, it assumes that there is no value of the current land use. Please consider to rephrase.	accept, we will reflect planting /reforestation in more balanced way. bUt note that lewis et al was also a commentary in Nature	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
13153	42	37	42	37	In my view, the sentence "Natural regeneration is the cheapest and technically easiest option." is not fully correct. The sources that Lewis et al. (2019) refers to, do not state this. An increasing amount of evidence shows that natural regeneration is a cost-effective approach to large-scale restoration (Chazdon, R. L., & Guariguata, M. R., 2016), and genrally results in higher restoration successes than active restoration (Crouzeilles et al., 2017). However, Reid et al (2018) found that comparisons between active restoration and natural regeneration are biased by positive site selection in favor of natural regeneration. My suggestion would be to reformulate the quoted sentence in such a way that it better aligns with the scientific consensus.	accept, we will reflect upon all the afforestation plans with the ins and outs	Johan de Jong	Wageningen University & Research	Netherlands
17293	42	37	42	37	Please make sure whoever thinks 34% of restoration / afforestation and reforestation is possible with natural regeneration has made sure that either the necessary seeding trees are still available or that the time horizon is long enough for trees to migrate into large clearings by natural succession.	accept, we will reflect on planting and natural regeneration better balanced	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany
30541	42	40	42	40	Lewis et al (2019) is not included in the reference list	Editorial. Copyedit to be completed prior publication.	Richard Betts	Met Office Hadley Centre	United Kingdom (of Great Britain and Northern Ireland)
12251	42		42		Concentrated mostly on the forestry, to what extent needs to make clear, rather than other land uses, despite the fact that uncertainty is huge. This should be based on the regionally-based global requirements of foods and feeds, etc. on land areas and thereby areas spare able for afforestation in particular. Social/private/public plantation at a small scale is enormous to consider though mostly be used for fuel, timber and relevant.	accept, a major rewrite of section (new 7.4) will take place	Mohammad Ibrahim Khalil	University College Dublin	Ireland
46367	42		42		Figure 7.17 - not understandable	reject this comment, but a major rewrite of section (new 7.4) will take place	Diana Feliciano	University of Aberdeen	United Kingdom (of Great Britain and Northern Ireland)
11303	42	10	43	14	what is the mitigation value per hectares of aforestation and reforestation?? Why is this so important? What is the global and regional trend in reforestation and aforestation? Do you have figures from the past and recent? Is it increasing or decreasing an what isthe impact??? please explain this in this section	accept, a major rewrite of section (new 7.4) will take place	Mahmood Riyaz	Maldivian Coral Reef Society	Maldives
18161	42	10	43	14	Consists largely of renarrations of definitions, little effort at assessing current research visible; small literature base.	accept, a major rewrite of section (new 7.4) will take place	Helmut Haberl	Institute of Social Ecology, University of Natural Resources and Life Sciences, Vienna	Austria
20687	42	16	43	14	This section fails to quantify the mitigation potential and costs of afforestation and reforestation. There are a number of publications using long term models which estimate this potential across a number of scenarios. Doelman, Jonathan C., et al. "Afforestation for climate change mitigation: Potentials, risks and tradeoffs." Global change biology (2019).	accept, a major rewrite of section (new 7.4) will take place	Vassilis Daioglou	Copernicus Institute of Sustainable Development	Netherlands
46237	42	10	44	17	Forest management interventions: It would be worth including a separate section on 'proforestation' a term coined to reflect the growing evidence that allowing older forests (70 years plus) to recover biological potential has broad applicabillity in all forest biomes but particularly temperate forests, delivering superior mitogation benenefits both in terms of the qantum of carbon sequestered in relevant time frames (2030 and 2050) and the stability of carbon storage compared to planting new forests; and improving the outlook for biodiversity and ecosystem services. (Moomaw et al 2019, "Intact forests in the United States: Proforestation Mitigates Climate Change and Serves the Greatest Good' Frontiers for Global Change). Simlar reesearch in Australia (Keith et al ,Re evaluatio of forest biomass carbon stocks and lessons from the worlds most carbon dense forests, PNAS 2009) points to an important source of relatively stable sequestrtaion potential that has to date been largely overlooked perahps based on the false assumption that long lived wood products can match the benefits of maintaining or increasing carbon in all relevant pools of forest carbon.	partly accept, a major rewrite of section (new 7.4) will take place , but we cannot follow every recent buzzword	Virginia Young	Australian Rainforest Conservation Society, Griffith University, CAN Ecosystems	Australia
32931	42	10	44	43	The whole subsection requires streamlining, i.e. a consistent discussion of the different options. While for some the focus is on defining the options (afforestation, reforestation), for others there's a lot of detail on mitigation potentials (improved forest management practices). In my opinion the latter is more important under a heading 'Assessment of AFOLU mitigation measures'.	accept, a major rewrite of section (new 7.4) will take place	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
46525	42	12	44	44	There is no discussion of tradeoffs and synergies with common forest resources, biodiversity, food security, indigenous rights or other issues related to sustainable development goals. There needs to be discussion of this for policy makers to assess the implications of these different options. See for example: Edstedt, K., & Carton, W. (2018). The benefits that (only) capital can see? Resource access and degradation in industrial carbon forestry, lessons from the CDM in Uganda. Geoforum, 97, 315. Osborne T. Tradeoffs in carbon commodification: A political ecology of common property forest governance. Geoforum. 2015;67:64.	partly accept, the FOD had a start of trade offs. a major rewrite of section (new 7.4) will take place	Rachel Bezner Kerr	Cornell University	United States of America

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
27637	42	16	44	17	Afforestation can have additional benefits. You could add that forests might be resiliant to heavy rains and help managing heavy rains. Herbaceous plants typically use the top meter of soil. Trees have much longer roots, litterature reports a dozen meters, yet tree roots have even been found in caves more than 100 m underground. Afforestation could have additional benefits, limiting heatwaves, attracting rain, channelling rain by tree roots. Sadhana forest afforestation project in India reported that afforestation improves the soil, reduces heat during the day and replenishes the aquifer, similar observations were mabe by the Yatir forest project, in Israel. Trees could also be more resiliant in alternance of drought and rain, when all rain falls in one day and there is 1 m of water in the fields for a couple days.	partly accept, the FOD had a start of trade offs. a major rewrite of section (new 7.4) will take place	Dorota Retelska	Independent	Switzerland
16503	42	16	44	44	Tree plantation and tree out of forest (ToF) could be used as a potential for mitigation purposes. Meanwhile, low forest cover countries (LFCCs) and their potential for plantation and their role on mitigation are totally neglected	partly accept, the FOD had a start of trade offs. a major rewrite of section (new 7.4) will take place	Mostafa Jafari	Head of TPS for LFCCs/ and IPCC LA	Iran
8557	42	10	45	8	I think the impact of forest management on soil organic carbon should be mentioned qualitatively/quantitatively here as well.	partly accept, the FOD had a start of trade offs. a major rewrite of section (new 7.4) will take place	Shoji Hashimoto	Forestry and Forest Products Research Institute / The University of Tokyo	Japan
17801	42		45		Many missing references cited here. But this happens in many other parts of the chapter.	partly accept, the FOD had a start of trade offs. a major rewrite of section (new 7.4) will take place	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
21797	42	3		7	Figure 7.17title is too long and difficult to undestand	Noted, revised title	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
10455	42	3			what is a "cost-constrained" mitigation potential? Please use existing terms (see glossary) before introducing new ones.	Noted and revised. Cost-constrained mitigation potential is economic potential.	Andy Reisinger	NZAGRC	New Zealand
3443	42	4			idem in figure 7.17	accept, editorial	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
10457	42	10			Much of this section is written in a text book style, covering ground that has been well trodden in previous assessments. Please focus on what adds to or modifies the previous assessments, and ensure you come up with clear concluding statements on those issues. For each option, I'm looking for clear information on the mitigation option, its potential (and what factors might constrain this potential), and its cost and cost-effectiveness (for a given carbon price), and key issues for deployment. Right now these core questions are not addressed in any systematic way.	accept, a major rewrite of section (new 7.4) will take place	Andy Reisinger	NZAGRC	New Zealand
12673	42	16			Afforestation, Reforestation and Forest Restoration	Editorial. Copyedit to be completed prior publication.	Eray Özdemir	General directorate of Forestry	Turkey
43299	42	26			piece of text repeats exactly from above	Editorial. Copyedit to be completed prior publication.	Deborah Lawrence	University of Virginia	United States of America
43303	42	31			not clear how to distinguish restoration from reforestation and afforestation. Is rest a subset of RA/AF?	accept, we will clarify, also in glossary	Deborah Lawrence	University of Virginia	United States of America
29705	42	35			Lewis et al. 2019; Add this article to the reference	Editorial. Copyedit to be completed prior publication.	RAEHYUN KIM	Institute	Republic of Korea
21799	42	38		40	so, 34% represent?	accept to be clarified	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
12675	42	40			agroforestry represent 21% (Lewis et al. 2019). All this activities should be adaptive.	Editorial. Copyedit to be completed prior publication.	Eray Özdemir	General directorate of Forestry	Turkey
38717	43	1	43	5	What about the large restaurations in China? (green Valley and others). Is the green wall programme considered?. In the Mediterranean a basin, restauration of drylands to prevent erosion and protect soils is ca common practice	accept, we will try to reflect better the regional efforts. but space is also limited	Maria Jose Sanz Sanchez	Basque Center for Climate Change	Spain
32921	43	1	43	14	Is there any quantification of the mitigation benefits from these projects? This can be helpful to showcase that forest restoration does make a contribution.	accept, we will try to include	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
12071	43	5	43	5	Please include Romjin et al. 2019 in the reference list	Editorial. Copyedit to be completed prior publication.	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
38719	43	7	43	14	Large program are easily racalled in the literature, but there is a lot of samll programs and traditions land protection practices in many countries that are ongoing and an are not recognized in the data, this relates to the importance to recognize the local and subnational actiities that in many cases are carri over due to other priorities such ersion prevention. Since they are occuring it is likely are included in the global potentiaas as proposing replacing those systems by large programas.	reject, we cannot go into all the details of small programmes. we can mention that small regional efforts are important as well.	Maria Jose Sanz Sanchez	Basque Center for Climate Change	Spain
12091	43	9	43	9	Please include Silva et al. 2019 in the refence list	Editorial. Copyedit to be completed prior publication.	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
12093	43	9	43	9	Silva is behind the NGP initiative, are there other studies that confirm their claim that 57% is restored or used as agriculture?	reject, we have no other info on this .	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
17131	43	12	43	12	Please make "much of it" more clear like latter phrase (43% is managed as timber planatation).	accept, editorial	KEIICHI IGARASHI	Mitsubishi UFJ Research and Consulting Co., Ltd.	Japan
12177	43	16	43	30	language here may be read (especially lines27-30) as to say that deforestation in the tropics is not mainly due to human interventions, but rather is caused by fires, storms, flooding and earthquakes. Suggest rewriting to make sure the role of humans in deforestation is adequatly spelled out.	Accepted, the text will be revised.	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
18163	43	16	43	30	Weak section, no substantial effort at assessing the topical literature visible. Consists largely of statements on the importance of forests for the global C balance (which are okay), but does not really inform the reader on forest management interventions (section title) aiming at reducing deforestation and forest degradation (section subtitle)	Accepted, the text will be revised focusing on the mitigation potentials.	Helmut Haberl	Institute of Social Ecology, University of Natural Resources and Life Sciences, Vienna	Austria
32121	43	16	43	30	It is very strange to have only 4 references on this important section related to the assessment of “Reduced deforestation and degradation”. At the global level we have already 1 decade of efforts of REDD+ and it is surprising that we have only 4 references to this section. For example, the Book (“Transforming REDD+: Lessons and new directions” https://www.cifor.org/library/7045/) can provide some lessons, etc…. Have a look on different chapters of this book to see if some information can be used to strengthen this section. For example a chapter (https://www.cifor.org/library/7062) was already assessing if the REDD+ process was a viable theory of change… form the literature review, others references may also be used to strengthen this section	The text will be revised focusing on the mitigation potentials. However, evaluation of REDD+ initiatives will be cover in the section on policies.	Denis Jean Sonwa	CIFOR (Center for International Forestry Reseacrh)	Cameroon
39787	43	17	43	18	is some text missing?	Editorial. Copyedit to be completed prior publication.	David Manning	Newcastle University	United Kingdom (of Great Britain and Northern Ireland)
12253	43	17	43	22	In general, it is necessary to set a target for mitigation from AFOLU and then estimate the sectoral requirements, if not done.	Rejected. The text will be revised focusing on the mitigation potentials. However, mitigation targets are not defined by the assessment.	Mohammad Ibrahim Khalil	University College Dublin	Ireland
26897	43	17	43	22	Experience with REDD+ suggests that the fact that forests are assessed as being cost effective means to reduce emissions is not sufficient to achieve reductions and the governance context was discussed on pages 38-39. This section needs to connect with what has been said previously.	The text will be revised focusing on the mitigation potentials. However, evaluation of REDD+ initiatives will be cover in the section on policies.	Louis Verchot	International Center for Tropical Agriculture	Colombia
32923	43	18	43	20	Unclear where the numbers come from. Please include a reference.	The text will be revised and references will be added.	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
38721	43	18	43	22	Please clarify this two sencnees, whay this results indicate that avoiding deforestation is necessary but sufficient for mitigation of CC?…. You mean in realtion to the contribution of other sectors? Becasue the sector needs to be C neutral?	The text will be revised focusing on the mitigation potentials.	Maria Jose Sanz Sanchez	Basque Center for Climate Change	Spain
41797	43	21	43	21	Please stress that most of the contribution to climate change mitigation from Natural Climate Solutions between now and mid century will come from avoided emissions from avoiding deforestation and ecosystem degradation. Protecting intact forests and native ecosystems should be a high priority.	The text will be revised focusing on the mitigation potentials.	Cecile Girardin	University of Oxford	United Kingdom (of Great Britain and Northern Ireland)
19805	43	24	43	30	Read in relation to page 9, lines 6 to 15, this seems somewhat inconsistent, and at least not easy to interpret: In page 9 it is stated that there is a net loss of forest land in the tropics, while p.43,lines 24-26 remain ambivalent. Followed by lines 26-27 an unclear picture remains especially at what is meant by "intact", which is not very well defined	Accepted, the different section will be compared to check for inconsistencies.	Michael Englisch	Austrian Research Centre for Forests	Austria
32925	43	26	43	26	Turubanova et al. (2018) missing in the reference list.	Editorial. Copyedit to be completed prior publication.	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
32927	43	27	43	27	Poker and MacDicken (2016) missing in the reference list.	Editorial. Copyedit to be completed prior publication.	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
17133	43	28	43	28	In the sentence "tropical forests are subjected to different drivers of forest degradation...", I would like to know from what drivers of tropical forest are different. I ruminate on the examples you mention (forest fires, severe storms, flooding, and earthquakes) can be seen in not tropical forest, such as in Australia, America and Japan	The text will be revised focusing on the mitigation potentials and not on the drivers of degradation.	KEIICHI IGARASHI	Mitsubishi UFJ Research and Consulting Co., Ltd.	Japan

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
39263	43	30	43	30	Consider the references: 1) Marcos Longo Michael Keller Maiza N. dos-Santos Veronika Leitold Ekena R. Pinagé Alessandro Baccini Sassan Saatchi Euler M. Nogueira Mateus Batistella Douglas C. Morton. Aboveground biomass variability across intact and degraded forests in the Brazilian Amazon. Global Biogeochemical Cycles Global Biogeochemical Cycles. Volume30, Issue11. November 2016. Pages 1639-1660. https://doi.org/10.1002/2016GB005465. 2) Danielle I Rappaport1,6, Douglas C Morton2, Marcos Longo3,4, Michael Keller3,4,5, Ralph Dubayah1 and Maiza Nara dos-Santos. Quantifying long-term changes in carbon stocks and forest structure from Amazon forest degradation. Environmental Research Letters, Volume 13, Number 6. 7 June 2018.	Thank you, references will be considered for potential inclusion.	Roberta Zecchini Cantinho	UNDP / UnB	Brazil
12083	43	33	43	41	The growth of boreal forest has increased due to climate change, but at the same time, the risk of damage from wind, insects and drought has increased. This will have an impact on forest management, is it possible to include more on the subject? The study from Pretzsch et al. (2014) (https://www.nature.com/articles/ncomms5967) and Ma et al. (2012) (10.1073/pnas.1111576109) gives an insight into the challenges.	accept, we will include more on impacts of climate change as well, but also refer to WGII	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
17299	43	33	43	41	Please rephrase this paragraph to recognize that improved FM options are not only directed towards forest carbon stocks, they can also be aimed at increasing the amount of wood that can be extracted sustainably and used in HWP, to use substitution effects for mitigation.	accept, we rewrite the section. we also have separate section on hwp	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany
27329	43	33	43	41	In this introduction, basic principles of forest growth and use need to be consistenly and unbiasedly presented. In particular, the passage does not really refer to a key trade-off in forest use, i.e. that carbon stocks are in steady state between in- and out-fluxes, thus harvest has a system effect on carbon stocks (reductions). This has to do with rotation length or harvest pressures, where increasing pressures are resulting in lower C-stocks, or in conditions where forests are regrowing, reduced sink strenghts, and results in robust accounting requirements (doi: 10.1038/nclimate1264, 10.1088/1748-9326/ab28bb). Results from steady-state considerations (10.1016/j.jenvman.2017.12.076, 10.1016/j.ecolmodel.2012.10.006) need to be included as well as options for forest management (that in many cases can only moderate, but not change the overall trade-off between increased use and lowered C-stocks (10.1111/j.1757-1707.2012.01173.x, 10.5849/jof.14-016, 10.1038/ngeo2782). Here, or at another position in the text, also a note on the limited potentials and many trade-offs (e.g. 10.1126/science.aaw2741) is needed (this would also fit well to one of the key points in the ES). It might also deserve an elaboration of the supposed carbon-neutrality in some /mainstream/ LCA-based approaches (see e.g. 10.1088/1748-9326/ab6b38 for a summary of issues and positions). Failing to reflect on these controversies (as in its current shape) - because there is currently a vivid controversy of high political attention going on (10.1111/gcbb.12643, 10.1038/s41467-018-06175-4, 10.1126/science.aat2305, etc.) - , will negatively affect the credibility of ch7 altogether.	reject, reviewer mostly refers to commentaries. these are not reviewed, but simply opinions. we will reflect better on all ins and outs of management , but to state that forest management declines the forest C stocks is too simple and not true in many cases	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
32929	43	36	43	36	Remove '(but not limited to)' and rather add a full list of mechanisms. An IPCC report should be comprehensive.	accept partly, we rewrite the section but also have to limit the space used for each measure.	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
12081	43	37	43	37	Are emissions from logging activity from the machines that are harvesting? Could you please clarify?	reject, we are not doing full LCA here. emissions from transport etc are in transport chapter	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
32033	43	39	43	39	silvicultural ' should be silvocultural?	Editorial. Copyedit to be completed prior publication.	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
33133	43	48	43	51	Consider including livestock as a major driver of forest degradation in tropics	accept, this is in drivers section	George Gatere Ndiritu	University	Kenya
28299	43	51	43	51	However, non-timber forest products do tend to contirbute significantly to improved forest management, through increased biodiversity in silvicultural systems, and as conservation incentives and livelihood alternatives in natural forests (Sardeshpande and Shackleton 2019).	accept, we will include NTFP	Mallika Sardeshpande	Rhodes University	South Africa
27325	43	32	44	17	this passage needs a revision towards unceratinty language and an assessment of the current body of understanding. Currently, only a selection of existing literature is reviewed, many more exist and need attention. Here a selection:e.g. 10.3389/ffgc.2019.00027, 10.1088/1748-9326/ab6b38, 10.3390/f9100592, 10.1016/j.foreco.2008.04.026, http://julkaisut.valtioneuvosto.fi/handle/10024/160591).	reject, although we recognise that the section can be improved and more balanced. reviewer gives lobby statement from Moomaw et al	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
5425	43	32	44	43	Before giving estimates of mitigation potential of forestry or HWP sink, it would be good to briefly summarise the determinants of the net carbon balance of forestry to show that the individual mitigation strategies ought to be assessed only in conjunction with the overall forest and wood use system, i.e., carbon stock changes in standing trees, soil, and harvested wood products (HWPs), and the avoided emissions through substitution. The net carbon emissions should then be assessed against a baseline or a counterfactual scenario to see, if the change in the system gives an overall credit or debit within a given timeframe (e.g., 100 years). Explaining this would be very useful, as it is not clear from the recent IPCC Special Reports, how exactly (already managed) forests ought to be managed to gain climate benefits in the short-term	accept partly, as the technical descriptions were also in AR5 and AR4, we keep these brief now	Elias Hurmekoski	University of Helsinki	Finland

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
18165	43	32	44	43	These are highly contested topics with large literatures, but the text does not convey insights on these debates and does not even attempt to assess the vailidity of the standpoints of the different "camps", respectively their methods and approaches.	accept partly, we rewrite the section and try to reflect better.	Helmut Haberl	Institute of Social Ecology, University of Natural Resources and Life Sciences, Vienna	Austria
27327	43	53	44	7	This passage critically below the standards of an "scientific assessment" (uncertainty language). Currently, it is does not even reach the level for a review paper, as it is relying on too few sources. Critical (in its positive sense) discussion of the terms and conditions as well as trade-offs of CSF are not mentioned; rather, it is currently a bit of hand-waving. More literature is needed here that corroborate findings, on principles and practices like e.g. available for "climate smart agriculture", and show where agreement and disagreement is. An assessment of the current state of knowledge (amount of evidence, level of agreement) is indispensable.	accept partly, we rewrite the section and try to reflect better.	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
9895	43	53	44	17	These two paragraphs can be precised and the littérature review could go beyond the two articles mentioned. 1) Highlighting that the CSF assessed here boils down to changing tree density and (probably mostly) replacement of slow growing hardwoods by fast growing softwoods. 2) Pointing out that there is also ample evidence from diverse countries and authors that in temperate managed forests, harvesting more (be it by shortening rotation lengths, harvesting abandonned old stands, intensified thinning, full tree harvest, ...) is detrimental to climate for at least the first 30-40 years (Agostini et al., 2013; Braun et al., 2016; Hudiburg et al., 2011; Lecocq et al., 2011; Roux et al., 2017; Valade et al., 2018) and 3) that the time-horizon over which the climate costs and benefits are integrated and the assumed impact of climate change on forest growth and mortality can change the relative climate merit of forest management scenarios (Valade et al., 2017).	accept partly, we rewrite the section and try to reflect better however reviewer is biased in his refs. .	Valentin Bellassen	INRAE	France
17799	43	5		5	Clean Development Mechanism (CDM), missing (CDM)	Editorial. Copyedit to be completed prior publication.	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
29771	43	5			Romjin et al. 2019; Add this article to the reference	Editorial. Copyedit to be completed prior publication.	RAEHYUN KIM	Institute	Republic of Korea
29797	43	7			Szulecka et al. 2014; Add this article to the reference	Editorial. Copyedit to be completed prior publication.	RAEHYUN KIM	Institute	Republic of Korea
29787	43	9			Silvia et al. 2019; Add this article to the reference	Editorial. Copyedit to be completed prior publication.	RAEHYUN KIM	Institute	Republic of Korea
3445	43	11			"c.11.1 million ha " is not clear	accept, editorial	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
29577	43	18			Erb et al. 2018;Add this article to the reference	Editorial. Copyedit to be completed prior publication.	RAEHYUN KIM	Institute	Republic of Korea
29709	43	18			Mader 2019; Add this article to the reference	Editorial. Copyedit to be completed prior publication.	RAEHYUN KIM	Institute	Republic of Korea
3447	43	21			one excess bracket	Editorial. Copyedit to be completed prior publication.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
21801	43	25			pls mention several countries?	If available, information will be included.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
29805	43	26			Turubanova et al. 2018; Add this article to the reference	Editorial. Copyedit to be completed prior publication.	RAEHYUN KIM	Institute	Republic of Korea
29743	43	27			Poker and MacDicken, 2016; Add this article to the reference	Editorial. Copyedit to be completed prior publication.	RAEHYUN KIM	Institute	Republic of Korea
21803	43	33			Noda, 2018	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
29567	43	40			Davis et al. 2009; Add this article to the reference	Editorial. Copyedit to be completed prior publication.	RAEHYUN KIM	Institute	Republic of Korea
29649	43	40			Hoover and Stout 2007; Add this article to the reference	Editorial. Copyedit to be completed prior publication.	RAEHYUN KIM	Institute	Republic of Korea
29737	43	41			Paquette and Messier, 2010; Add this article to the reference	Editorial. Copyedit to be completed prior publication.	RAEHYUN KIM	Institute	Republic of Korea
29655	43	46			Hu et al. 2018; Add this article to the reference	Editorial. Copyedit to be completed prior publication.	RAEHYUN KIM	Institute	Republic of Korea
598	44	1	44	15	Please clarify the relationship between the 420 Mton CO2 y-1 figure at line 6 and the 7.3-11.1tons of C at line 16. Is the last number the summation of the first over the century?	reject, sentences are clear. reviewer has not read the difference in time scale between the two numbers, although it is clearly there	Pierre Bernier	Natural Resources Canada	Canada

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
5431	44	5	44	7	It would be informative to show the reader, which carbon flows (managament strategies) the additional 420 Mtons of CO2 consists of, as well as to make explicit the possible trade-offs between different strategies and uncretainties regarding the estimates. For example, in the short-term in the European context there is likely to be a trade-off in increasing harvest for material and energy uses (HWP sink and substitution impacts), and reducing harvest to accumulate more carbon in the forest ecosystem. It would also be informative to indicate the confidence of the statement	accept partly, we cannot go into lot of detail of one study. will elaborate a bit	Elias Hurmekoski	University of Helsinki	Finland
27331	44	9	44	17	these results need to be contrasted / confirmed with other studies. In particular, also studies that take biophysical effects into account are needed here, in an assessment style. The finidng of Naudts et al.10.1126/science.aad7270 and Luyssaart 10.1038/s41586-018-0577-1 need a good representation and contextualization here.	accept, we will have a CA on SLCF, biophysics etc	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
27333	44	19	44	35	please include: https://doi.org/10.1088/1748-9326/ab1e95	Thank you, the reference will be considered.	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
37449	44	19	44	43	In this section on HWPs it could be relevant to mention the different reporting methods used by governments and their implications. E.g. see Fyson and Jeffery 2019 (Earth's Future) for a discussion of this.	reject, the 6AR assessment are not about Guidelines and manners of accounting	Michiel Schaeffer	Climate Analytics	Netherlands
11305	44	20	44	23	Why focused on wood?? Where are the others?	accept, we will improve section	Mahmood Riyaz	Maldivian Coral Reef Society	Maldives
5433	44	20	44	24	The HWP carbon sink should only be assessed as a part of the overall forest and wood use system, because there can be a trade-off between increasing the forest C sink and the HWP C sink.	accept, we agree. we will try to phrase this in SOD	Elias Hurmekoski	University of Helsinki	Finland
38637	44	26	44	30	Wood material substitution is definitely a wood-utilization mitigation policy, which already mentioned in AR5. Here only China's case study is referred, but I believe a lot of this type of scientific studies already exist and if possible, it is desirable to refer global level of study or adding other countries case here.	accept, we will improve section	Atsushi Sato	Mitsubishi UFJ Research and Consulting Co.,Ltd.	Japan
5427	44	26	44	35	The references are not very exhaustive. Related to this, in addition to construction products and other solid wood products, a wide range of end uses across several value chains substituting more emission-intensive materials and energy exist and could be considered, such as textiles and chemicals. A few additional relevant references for consideration: Gustavsson et al. 2017. https://doi.org/10.1016/j.rser.2016.09.056. Soimakallio et al. 2016. https://doi.org/10.1021/acs.est.6b00122. Seppälä et al. 2019. https://doi.org/10.1016/j.jenvman.2019.06.031. Hurmekoski et al. 2020. https://doi.org/10.1111/jiec.12981.	Thank you, references will be considered for potential inclusion. The use of biomass will be presented in different chapters	Elias Hurmekoski	University of Helsinki	Finland
5429	44	26	44	35	Technology and related environmental footprint will not remain unchanged in time. On one hand, the substitution impacts can be assumed to be reduced in the future due to the decarbonization of the energy sector and the consequently decreasing emissions of some of the alternative manufacturing industries. On the other hand, there will be completely new types of products, also wood-based products (e.g. micro fiber based construction products) that may have an entirely different environmental profile than the engineered wood products of today. It would be important to acknowledge that the evolution of the market creates a lot of uncertainties.	accept, good point. we will try to phrase this in SOD	Elias Hurmekoski	University of Helsinki	Finland
39629	44	27	44	28	This sentence is difficult to read - suggest repharasing	Editorial. Copyedit to be completed prior publication.	Shobha Maharaj	Independent Consultant	Germany
6897	44	32	44	35	I would avoid having a sentence for a paragraph. Please consider the suggetion throughout the chapter.	Editorial. Copyedit to be completed prior publication.	Valasia Iakovoglou	International Hellenic University	Greece
38639	44	32	44	35	The example of wood use in civil engineering is fine to refer here. However, by using the IPCC guidelines (the 2006GL and the 2019 RM), those mitigation evaluation can be done only under Tier 3 and so country must correct data and develop own methods for civil engineering. This fact is considered worth referring here.	reject, the 6AR assessment are not about Guidelines and manners of accounting	Atsushi Sato	Mitsubishi UFJ Research and Consulting Co.,Ltd.	Japan
27335	44	37	44	43	Wood substion potentials are elaborated at depth in AR5, here new developments should be displayed.	accept, in whole chapter, more emphasis will be put on new developments since AR5	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
17301	44	42	44	42	Griscom et al. (2018) is not given in the list of references.	Editorial. Copyedit to be completed prior publication.	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany
600	44	42	44	43	Please coordinate this sentence with the one at p. 72, l. 28-30	Editorial. Copyedit to be completed prior publication.	Pierre Bernier	Natural Resources Canada	Canada
10583	44	46	44	46	"Restoration of degraded peatlands" is a more precise topic of the paragraph	Noted, we re-structured and extensively revised this section.	Wen Zhang	Institute of Atmospheric Physics, Chinese Academy of Sciences	China
32933	44	46	44	46	Doesn't make sense to introduce a subsection 'Restoration of degraded lands' where only 'Peatland restoration' is discussed.	Noted, we re-structured and extensively revised this section.	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
25869	44	46	44	54	In this section only “restoration” is considered for peatlands. However, there are countries like Chile, where the exploitation of peatlands is still promoted. This section should consider "Protection-Conservation" in addition to restauration. It would be more cost effective to protect than to allow degradation of the ecosystem and have to implement restauration mechanisms afterwards. In Chile, it is currently under debate whether peatlands should be included as part of Chile´s 2020 NDCs, and it is also being discussed if they should be explicitly incorporated as part of the new Law on Climate Change (Hoyos et al, 2019; 10.1126/science.aaz9244).	Noted, we re-structured and extensively revised this section.	Jorge Hoyos-Santillan	University of Magallanes	Chile
25871	44	46	44	54	Additional information regarding the current C accumulation rates may be useful. This will allow to know the potential annual contribution of peatlands as carbon sinks and not just as reservoirs. In addition, it may be true that the area in the tropics is smaller; however, the carbon content/area ratio makes them very important among carbon reservoirs as they are very efficient.	Noted, we re-structured and extensively revised this section. We included information on c accumulation rates	Jorge Hoyos-Santillan	University of Magallanes	Chile
32935	44	46	44	54	Requires references.	Noted, we re-structured and extensively revised this section. We added various references	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
602	44	48	44	52	This comment may be out of place, but I failed to find any text for tropical regions of peatlands being drained and burned for palm-oil plantations, which is a very regionnally-specific case of commercially-driven peatland destruction and GHG emissions. I am surprised at the omission of this regionnally-specific source of GHG because the purpose of this text is specifically to regionalize mitigation options.	Noted, we re-structured and extensively revised this section. We added reference to tropical peatlands and drivers of conversion	Pierre Bernier	Natural Resources Canada	Canada
27599	44	48	44	54	I don't see why peatlands, that cover such limited portion of Earth surface, account for such a large portion of organic carbon, and soil, covering >90% of continents surface, is described as containing much less carbon. At least forest soil, but many other organic soils, are carbon-rich too. They contain organic leaves, animals, bacteria. Some autors report that soil mass >50% living bacteria, ie organic compounds. Do peatlands contain carbon concentrated molecules such as bitumen? Otherwise it doesn't seem to add up. Was soil carbon comptablised correctly? Did Mankind lose so most soil carbon that was there before?	Noted, we re-structured and extensively revised this section. We included information on c accumulation rates	Dorota Retelska	Independent	Switzerland
19807	44	49	44	54	It is not clear where the numbers in this paragraph derive from. However, Shangqi Xu, Xia Liu, Xiujun Li, Chunjie Tian, Soil organic carbon changes following wetland restoration: A global meta-analysis,Geoderma, Volume 353,2019,Pages 89-96,ISSN 0016-7061,https://doi.org/10.1016/j.geoderma.2019.06.027. give other numbers and views, especially in context of peatlnd's percentage on land surface and conclusions.	Accept, will include reference, thank you	Michael Englisch	Austrian Research Centre for Forests	Austria
1469	44	50	44	50	Xu et al. (2018) refined the estiamtes of global peatalnd distribution, and PEATMAP has been used in various studies, which could provide the foundamental information associated withe peatland distribution for its restoration. Add the reference of "Xu et al. (2018)" after "terrestrial surface" in line 50. (Xu, J., Morris, P. J., Liu, J. & Holden, J. PEATMAP: Refining estimates of global peatland distribution based on a meta-analysis. Catena 160, 134-140 (2018).)	Accept, will include reference, thank you	JUNGUO LIU	Southern University of Science and Technology	China
6077	44	53	44	53	Northern peatlands - does this include frozen peatlands (permafrost)?	Noted, will clarify in revised section	Sharon Smith	Geological Survey of Canada, Natural Resources Canada	Canada
39707	44	46	45	9	This sectiion is completely missing the options to restore degraded land other than peatland. As the literature indicates, there is a significant potential for non-peatland restoration (e.g. ref: Elbersen et al. 2019 in this chapter; Pancaldi, Francesco & Trindade, Luisa (2020) Marginal Lands to Grow Novel Bio-Based Crops: A Plant Breeding Perspective. Frontiers in Plant Science 11 DOI: 10.3389/fpls.2020.00227; Rahman, Syed et al. (2019) Integrating bioenergy and food production on degraded landscapes in Indonesia for improved socioeconomic and environmental outcomes. Food Energy Secur. 2019: e00165 https://doi.org/10.1002/fes3.165; Borchard, Nils et al. (2018) Screening potential bioenergy production of tree species in degraded and marginal land in the tropics. Forests 9 (10): 594; Chiaramonti, David & Panoutsou, Calliope (2018) Low-ILUC Biofuel Production in Marginal Areas: Can Existing EU Policies Support Biochar Deployment in EU MED Arid Lands under Desertification? Chemical Engineering Transactions 65: 841-846; Fernando, Ana et al. (2018) Environmental impact assessment of perennial crops cultivation on marginal soils in the Mediterranean Region. Biomass and Bioenergy 111: 174-186; Kumar, S. & Ghosh, P. (2018) Sustainable bio-energy potential of perennial energy grass from reclaimed coalmine spoil (marginal sites) of India. Renewable Energy 123: 475-485; Nazli, R. et al. (2018) Miscanthus, switchgrass, giant reed, and bulbous canary grass as potential bioenergy crops in a semi-arid Mediterranean environment. Industrial Crops and Products 125: 9-23; Awasthi, A.; Singh, K. & Singh, R. (2017) A concept of diverse perennial cropping systems for integrated bioenergy production and ecological restoration of marginal lands in India. Ecological Engineering 105: 58-65; Fritsche, Uwe R. et al. (2017) Energy and land use. Working Paper for the UNCCD Global Land Outlook. Darmstadt etc. http://www.iinas.org/tl_files/iinas/downloads/land/IINAS_2017_UNCCD-IRENA_Energy-Land_paper.pdf;	Noted, we re-structured and extensively revised this section. Restoration of other ecosystems are now described in separate sections. The bioenergy references will be considered in the bioenergy section.	Uwe Fritsche	IINAS	Germany
33135	44	48	45	8	Tropical wetlands missing though store susbstancial amount of GHG	Noted, we re-structured and extensively revised this section. We added reference to tropical peatlands and drivers of conversion	George Gatere Ndiritu	University	Kenya
26899	44	49	45	8	There is only 1 reference in this section, but the literature on peatland restoration is fairly diverse. Uncertainty language here and throughout would be useful.	Noted, we re-structured and extensively revised this section, adding more information and uncertainty language	Louis Verchot	International Center for Tropical Agriculture	Colombia

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
42435	44	7			Please add after line 7: In light of the changing objectives of policies and regulations related to forests and TOFs in India, it is suggested that upcoming Indian forest policy should have defined objectives based on the specific functions of forests, namely restoration, conservation and production. Conservation policy should focus on maintaining ecological balance and improving biodiversity through a holistic approach of protected area management. The effectiveness of policy-guiding conservation should be reviewed based on the periodic monitoring of biodiversity richness in these areas, instead of only focusing on converting more areas to sanctuaries and national parks. Similarly, restoration policy should be targeted at the reclamation, rehabilitation and regeneration of degraded landscapes and wastelands, depending on the severity of degradation. The restoration policy and its corresponding programme should lead to time-bound action plans for the rehabilitation of degraded areas. Production forestry should focus on a sustainable increase in forest productivity (timber production) from RFAs and TOFs. The need for valid record and consistent data keeping with respect to timber production is also important for effectively monitoring the implementation of any policies or acts. Additionally, the GoI should mandate state forest departments to report progress on each of the three functional objectives (conservation, restoration and production) through standard indicators. This will also help in developing a comprehensive framework for monitoring and reporting on the productivity of government managed forests and TOFs. In this regard, the operationalization of the REDD+ framework would not only hold the government forest departments more accountable, but would also help in benefiting from additional international finance as a mitigation measure to climate change. (Ghosh and Sinha, 2016) Ref: Ghosh, M. and Sinha, B. 2016.Impact of Forest Policies on Timber Production in India: A review. Natural Resources Forum (DOI: 10.1111/1477-8947.12094).	Noted, thank you for suggestion, we will rewrite forest management section to reflect more circumstances	Bhaskar Sinha	Indian Institute of Forest Management	India
29907	44	10			Yousefpour et al. 2018; Add this article to the reference	accept, editorial	RAEHYUN KIM	Institute	Republic of Korea
22701	44	16			Clarify if this is additional C sequestration due to CSF or total.	accept, we will improve	Melissa Lucash	Portland State University	United States of America
12677	44	19			Sustainable wood utilization	Editorial. Copyedit to be completed prior publication.	Eray Özdemir	General directorate of Forestry	Turkey
29587	44	22			FAO, 2016a; Add this article to the reference	Editorial. Copyedit to be completed prior publication.	RAEHYUN KIM	Institute	Republic of Korea
29735	44	22			Palma et al. 2016; Add this article to the reference	Editorial. Copyedit to be completed prior publication.	RAEHYUN KIM	Institute	Republic of Korea
22703	44	24			Add the time period? As in increasing share of the two latter products over the last X years.	accept, editorial	Melissa Lucash	Portland State University	United States of America
43305	44	26			grammar check needed	Editorial. Copyedit to be completed prior publication.	Deborah Lawrence	University of Virginia	United States of America
29619	44	30			Geng et al. 2019; Add this article to the reference	Editorial. Copyedit to be completed prior publication.	RAEHYUN KIM	Institute	Republic of Korea
43307	44	32			need some numbers here--not adequate to just describe the option, especially when it might be very small. Adequate, consistent treatment of mitigation options requires attaching s.ome numbers to each one (like from fig 7.16) so we have context to judge what is important. not all are equal	accept, the SOD will have a proppe quantification of the role of HWP	Deborah Lawrence	University of Virginia	United States of America
29671	44	33			Kayo and Noda 2018; Add this article to the reference	Editorial. Copyedit to be completed prior publication.	RAEHYUN KIM	Institute	Republic of Korea
29675	44	38			Keith et al. 2015; Add this article to the reference	Editorial. Copyedit to be completed prior publication.	RAEHYUN KIM	Institute	Republic of Korea
29783	44	38			Schlesigner, 2018; Add this article to the reference	Editorial. Copyedit to be completed prior publication.	RAEHYUN KIM	Institute	Republic of Korea
29515	44	39			Abood et al. 2014; Add this article to the reference	Editorial. Copyedit to be completed prior publication.	RAEHYUN KIM	Institute	Republic of Korea
29627	44	42			Griscom et al. 2018; Add this article to the reference	Editorial. Copyedit to be completed prior publication.	RAEHYUN KIM	Institute	Republic of Korea
38727	44	46			Whay only peatland restauration is conidered in the section on restauration of degraded lands?, what about restauration of drylands which can be done not necessaely by planting forest?	This subsection has been extensively revised. Restoration of various ecosystems are now in separate sections	Maria Jose Sanz Sanchez	Basque Center for Climate Change	Spain
14803	45	5	45	8	rewetting of peatland may emitt N2O by the process of denitrification and flooding will lead to CH4 emission,	Noted, will mention	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
15131	45	10	45	10	Most part of the planet’s boreal forests (about 70%) are located in Russia, mainly in Siberia. The productivity of Siberian forests is significantly lower than that of tropical or broad-leaved forests of the temperate zone. However, the boreal forests of Siberia have a specific carbon cycle, which consists in the fact that dying parts of plants in harsh climatic conditions are poorly decomposed, the work of microorganisms, fungi and insects that destroy phytodetrite slows down, which ensures the preservation of dead organics in the soil for a long time and reduces carbon emissions into the atmosphere.	Noted, thank you for the info	Aleksandr Kraevoy	UC RUSAL	Russian Federation

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
15183	45	10	45	10	Most part of the planet’s boreal forests (about 70%) are located in Russia, mainly in Siberia. The productivity of Siberian forests is significantly lower than that of tropical or broad-leaved forests of the temperate zone. However, the boreal forests of Siberia have a specific carbon cycle, which consists in the fact that dying parts of plants in harsh climatic conditions are poorly decomposed, the work of microorganisms, fungi and insects that destroy phytodetrite slows down, which ensures the preservation of dead organics in the soil for a long time and reduces carbon emissions into the atmosphere	Noted, thank you for the info	Aleksandr Kraevoy	UC RUSAL	Russian Federation
38945	45	10	45	12	Grasssland'' is a IPCC land use category, which corresponds to FAO's ''permanent meadoews and pastures''. It si not clear whether the term here refers to --as it is well known that the term ''grassland'' has its own distintinct meaning in ecosystem modeling, which is more of a land cover class than a land use category. In any case, FAOs estimate is of 3.3 billion ha, and refers to permanent meadows and pastures (see for instance http://www.fao.org/economic/ess/environment/data/land-use/en/)	Noted. This subsection will be be extensively revised. Revisions will be made with cognisance of appropriate use of the term.	francesco tubiello	FAO	Italy
27337	45	14	45	16	The statement on the extent of grasslands needs to be brought in line with SRCCL (ch1), it either should not only referring to the FAO figure on permanent pastures and meadows) but also include other "grasslands" according to the IPCC definitions in the BestPracticeGuidelines (Grasslands are defined much broader there), or state that the 34 Mkm2 refer to areas. that are used more then 5 years as pastures . An uncertainty statement is also needed. This is indispensable from a consistency point of view.	Noted. The use of the term 'grasslands' will be carefully considered during planned extensive revision of the subsection.	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
9283	45	14	45	28	Suggest consideration of the work of Fornara et al 2020 (https://doi.org/10.1016/j.agee.2019.106705) in this section. This work indicates that for temparate grassland carbon stocks have been relativley resistant to increasing intenficiation of grassland managment.	Noted. The authors thank the reviewer for their suggested reference which will be considered in revisions	Eamon Haughey	Trinity College Dublin	Ireland
11307	45	14	45	38	What is the global reagional trend in grassland management??	Noted. Extensive revisions are planned for this subsection, in line with the entire mitigation section. The inclusion of discussion on regional trends in management will be considered during revisions.	Mahmood Riyaz	Maldivian Coral Reef Society	Maldives
32939	45	15	45	15	FAO (2016) missing in the reference list and probably not correct reference for statement about C sequestration potential.	Accepted. The authors thank the reviewer for noting this. The inclusion of references will be checked.	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
27339	45	20	45	20	this is a too generic statement, needs qoutes and an assessment	Accepted. This sentence will be changed.	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
46527	45	20	45	22	Intensification of livestock is not directly linked to population growth but to dietary changes along with other factors such as subsidies for grains which make livestock feed less expensive (see for example: Lorent Hugues, Sonnenschein Ruth, Tsiourlis Georgios M., Hostert Patrick, & Lambin Eric. (2009). Livestock Subsidies and Rangeland Degradation in Central Crete. Ecology and Society, 14(2).) and allow for industrial livestock production. Political-economic and ecologica analysis of livestock intensification needed, rather than assumptions about it built into text. See for example Tscharntke T, Clough Y, Wanger TC, et al. Global food security, biodiversity conservation and the future of agricultural intensification. Biological Conservation. 2012;151(1):53-59. doi:10.1016/j.biocon.2012.01.068.	Noted. This statement will be revised as part of wider, planned changes to the subsection. Thank you for suggested references.	Rachel Bezner Kerr	Cornell University	United States of America
22427	45	21	45	21	Change "massive increasing" to "projected increases in"	Noted. This will be changed as part of wider planned changes to the subsection	Donald Smith	McGill University	Canada
22429	45	22	45	22	Change "converted" to "grassland conversion"	Noted. The sentence will be changed, most likely as part of a substantive reformatting of the subsection	Donald Smith	McGill University	Canada
27341	45	23	45	28	The para should also discuss the effects of converting extensively to intensively use grasslands; bush encroachment is also missing, but needs attention (increases e.g. C-Stocks under certain circumstances).	Noted. The paragraph will be changed as part of planned wider revisions to the subsection. The authors thank the reviewer for their suggestion regarding bush encroachment, which will be considered.	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
32941	45	25	45	28	Any chance to include short explanation what 'poor pasture management' and 'proper soil management' entails?	Noted. The subsection will be extensively revise. Better explanation of 'poor pasture management' will be included as required.	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
38969	45	27	45	27	"Proper soil management" is too general; explain and give citations.	Accepted and it will be developed	Vassilis Litskas	Cyprus University of Technology; Open University of Cyprus	Cyprus

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
8565	45	29	45	29	The reference paper(Jeong el al., 2016) is missing in references.	Noted. The authors thank the reviewer for pointing this out. Referencing will be checked.	Eun Jung Choi	National institute of agricultural sciences	Republic of Korea
9285	45	29	45	30	Line states 'Total soil C is a standard indicator of changes...' - it would be useful to clarify here what the definition of total soil C is - possibly a glossary definition needed (if it does not exist). The reason I highlight this is that soil the depth to which 'total C' is measured varies greatly in the field experiments and soil surveys - the contribution of deep soil carbon may or may not be included without further clarification here.	good comment and it is noted	Eamon Haughey	Trinity College Dublin	Ireland
9897	45	29	45	31	I don't know the two studies quoted here (and they are not in the list of references). But beware that the figures provided in these sentences contradict other IPCC reports and authoritative reviews on the topic. (Poeplau et al., 2011), to quote only the meta-analysis with the largest sample size, averages at 0.5 tC/ha/yr over 100 yrs.	The authors thank the reviewer for noting this. The subject of C loss from cultivation / conversion will be revised and changed as part of wider planned changes to the entire subsection. In addition, the proper listing of references will be checked.	Valentin Bellassen	INRAE	France
17135	45	29	45	31	In this sentence, we know the extent of the carbon loss after grassland conversion to cropland and duration by new equilibrium of soil organic carbon. The infomariton of the region where two values (1.8 ton/ha/yr and 17 years) were observed is signifcant. I would like you to add this information.	Noted. This sentence will be revised as part of wider planned changes to the subsection. If the sentence remains, discussion on where the research was conducted will be given.	KEIICHI IGARASHI	Mitsubishi UFJ Research and Consulting Co., Ltd.	Japan
26901	45	29	45	31	Total soil C as a stand alone statistic is meaningless. SOC varies based on soil texture, mineralology, climate (temperature and rainfall), ecosystem productivity, etc. This average of 1.81 is for which biome? What is the SD? The figure 17 years is not universal, please provide more nuance. In some instanaces equilibrium is reached after 50 years. This section creates the misleading impression that soil C sequestration is easy and large, but it is not. The reference Khalil 2019 appears to be a book chapter, not peer reviewed literature; it is not in the list of cited literature. Please do a proper summary of the state of the science on this and use IPCC uncertaintly language when drawing conclusions, particularly quantitative ones	Accepted. The authors note the need for more comprehensive discussion regarding the studies mentioned, but also much wider assessment of peer-reviewed literature. The entire subsection will be revised.	Louis Verchot	International Center for Tropical Agriculture	Colombia
1007	45	29	45	34	Text cites Khalil et al. 2019. Not in reference list. Quotes rates of soil C loss after change from grassland to cropland and time to reach new equilibrium but does not state context – what climate, soil type? The values quoted are meaningless without this.	Noted & acceptd. There is need for more information to contextualise the figures outlined, as well as proper listing of references. The subsection will be changed as part of wider revisions to the section.	David Powlson	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
27343	45	29	45	38	This para is a mix of description of the current state and "improvement" (next subchapter). Needs revision, in direction of "uncertainty language". This report could be used for many points related to grazing and livestock and could help in improving the subchapter(s): https://www.fcrn.org.uk/sites/default/files/project-files/fcrn_gnc_report.pdf	Noted. The subsection will be extensively revised. The authors thank the reviewer for their suggested reference.	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
22431	45	31	45	31	Change "17 years" to "several decades"	Accepted. The entire sentence will be changed in accordance with wider planned revisions.	Donald Smith	McGill University	Canada
32035	45	31	45	31	some refs missing in list for example: Khalil et al. 2019	Noted. The listing of references will be thoroughly checked.	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
25771	45	31	45	32	17 years stated as a fixed fact, but this actually varies depending on soil type etc. Page 50 line 50 suggests different time periods for this (Lal paper)	Accepted. This sentence will be changed as part of wider planned revisions of the section.	Helen Hughes	University of Edinburgh	United Kingdom (of Great Britain and Northern Ireland)
743	45	34	45	34	Cardinael et al., (2018) conducted a systematic literature review on the conversion of cropland, forest and grassland to agroforestry systems. This paper provided stock change factors for 8 main types of agroforestry systems in different regions and climate worlwide. It served as the basis to improve the C sequestration potential of agroforestry systems in the 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. This is probably a very valid reference here concerning the conversion of pastures to silvopastures. Cardinael, R., Umulisa, V., Toudert, A., Olivier, A., Bockel, L., Bernoux, M., 2018. Revisiting IPCC Tier 1 coefficients for soil organic and biomass carbon storage in agroforestry systems. Environ. Res. Lett. 13, 1–20. doi:https://doi.org/10.1088/1748-9326/aaeb5f See also: Ogle, S.M., Wakelin, S.J., Buendia, L., McConkey, B., Baldock, J., Akiyama, H., Kishimoto-Mo, A.W., Chirinda, N., Bernoux, M., Bhattacharya, S., Chuersuwan, N., Goheer, M.A.R., Hergoualc'h, K., Ishizuka, S., Lasco, R.D., Pan, X., Pathak, H., Regina, K., Sato, A., Vazquez-Amabile, G., Wang, C., Zheng, X., 2019. Cropland - Chapter 5, in: Volume 4 - Agriculture, Forestry and Other Land Use. 2019 Refinement to the 2006 Guidelines for National Greenhouse Gas Inventories. IPCC, Hayama, Japan. Https://Www.Ipcc-Nggip.Iges.or.Jp/Public/2019rf/Index.Html.	Noted. The authors thank the reviewer for their suggested reference, which will be taken into account during planned revision of the entire section.	Rémi CARDINAEL	CIRAD	France
22433	45	35	45	35	Change "Practices" to "practies such"	Accepted. This sentence will be changed as part of wider revisions planned for the section.	Donald Smith	McGill University	Canada
9287	45	35	45	38	Suggest adding reference to adaptation co-benefits of using multi-species swards to improve the drought resilience of agricultural grasslands (Haughey et al 2018 - DOI:10.1038/s41598-018-33262-9). Also some evidence that multispecies swards have higher carbon sequestration potential also - but further investigation required under agri-managment (Mommer et al 2010, doi: 10.1111/j.1365-2745.2010.01702.x).	Noted. The authors thank the reviewer for their suggested reference.	Eamon Haughey	Trinity College Dublin	Ireland
38971	45	35	45	38	I am skeptical for the effects on biodiversity, especially for the Mediterranean grasslands.	Noted. It is hoped that revisions of the subsection will satisfy the reviewers comment.	Vassilis Litskas	Cyprus University of Technology; Open University of Cyprus	Cyprus

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
27345	45	41	45	46	The passage needs some elaboration, in particular also related to uncertainty (which is very high related to grazing as well as improvement-options). We have assessed some aspects of this in 10.1002/2016GB005601 and a perspective on improvement in 10.1111/gcb.13591, see also 10.1111/gcb.13800. Furthermore, changes in the Animal Production Systems could show large potentials, but would change production levels, see the term "circular livestock systems" (10.1016/j.gfs.2019.06.003, 10.1016/j.jclepro.2019.01.329, 10.1111/gcb.14321)	Noted. The authors thank the reviewer for the suggested reference which will be considered. Substantial revisions of the subsection are planned, including this passage.	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
22435	45	42	45	42	Change "globaly" to "globally used"	Noted. This sentence will be changed as part of wider revisions to the subsection.	Donald Smith	McGill University	Canada
15797	45	43	45	43	The Wang et al 2018 quote is missing from the reference list at the end of the chapter.	Noted. References will be thoroughly checked.	EDUARDO PEDRO FRACASSI	ITBA Instituto Tecnologico de Buenos Aires	Argentina
15799	45	43	45	43	The Chai et al 2019 quote is missing from the reference list at the end of the chapter.	Noted. All references will be thoroughly checked.	EDUARDO PEDRO FRACASSI	ITBA Instituto Tecnologico de Buenos Aires	Argentina
39265	45	43	45	43	Consider the reference: Stoécio M.F.MaiaaStephen M.OglebCarlos E.P.CerriaCarlos C.Cerri. Effect of grassland management on soil carbon sequestration in Rondônia and Mato Grosso states, Brazil. Geoderma. Volume 149, Issues 1–2, 15 February 2009, Pages 84-91	Noted. The authors thank the reviewer for their suggested reference.	Roberta Zecchini Cantinho	UNDP / UnB	Brazil
32943	45	44	45	45	Probably 'improved grazing management' does not reduce the whole 'adverse impacts of intensive farming on climate'. Please rephrase.	Accepted. This sentence will be changed as part of wider changes to the subsection.	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
38843	45	45	45	46	What kind of models are being used? What about model simulations for non-tropical areas? One could also argue there are more factors than timing and duration of rest and grazing periods. There is also the stocking rate, as well as the spatial utilization of the paddock or grazed area. How do these factors affect environmental benefits?	Noted. It is accepted that additional information is required. However, this paragraph will be changed as part of wider revisions to the subsection.	Julian Reyes	Personal Capacity	United States of America
20047	45	10	51	14	The title of section 7.5.3 suggests that it is a summary of key agricultural mitigaiton options. It doesn't have a section on cropland management (there is a crop nutrient management section in section 7.5.4 - is it wrongly placed under 7.5.4?	crop management including nutrient use and management section will be further developed	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
20049	45	10	51	14	In section 7.5.3 there is a subsection on grassland management and another on soil C sequestration - there are big overlaps between those two, I suggest merging, or removing the C sequestration related paragrphs from the grassland management section	the sections will be merged	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
27149	45	10	54	20	The structure of this section lacks coherence and needs a complete reorganization to my opinion. The different sections mix technical actions (as grassland management optimization), expected results (as soil carbon sequestration) and combined actions (as conservation agriculture or organic farming). In addition some actions are presented in an incoherent way (« Organic farming » is presented as a sub section of « conservation agriculture » ; there is overlap between « Integrated production systems » P48L26 – P49L39 and section 7.5.7 P59L1-P59L15). To be really useful, I suggest presenting separately technical actions in the section « 7.5.3 agricultural interventions ». For each action, a rapid description, an estimate of its current impact, its mitigation potentialities and its undesired effects (if any) should be given. This section could be followed by sections focusing on systems that combine some of these actions : 7.5.4 Conservation agriculture and 7.5.5 organic farming. The chapter could finish with 7.5.6 bioenergy ; 7.5.7 biochar and 7.5.8 demand side appraoches. Technical actions in 7.5.3 could include : For livestock farming : a) Optimize grassland management b) Reduce enteric fermentation c) Reduce proteic content in animal food d) Optimize manure management and develop biogas plants For crops e) Optimize nutrient management (type of fertilisation, timing and quantity ; introduction of legume) f) Optimize rice field management g) Optimize irrigation h) Develop minimum tillage techniques i) Develop permanent soil cover with crop residues and live mulches j) Develop crop rotation and intercropping For livestock farming and crops k) Develop integrated production systems l) Develop agroforestry (NB : actions h) , i) and j) are the 3 principles of conservation agriculture as defined by FAO while action e) is one basis of	Good comments. Sections will be re-organized	Marc Aubinet	University of Liege	Belgium

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
27237	45	10	54	20	Many confusion is introduced by the simultaneous use of different units: remove all non SI units, use only g (and multiples M, G, T P). I undrestand that it it sometimes more relevant to speak about gC and sometimes gCO2 but avoid mixing the two units in the same analysis (or maybe better, give systematically both values)	good comments. SI will be used across chapter even references used sometimes non SI	Marc Aubinet	University of Liege	Belgium
27239	45	10	54	20	All the values presented here refer to regional sums or emission/sequestration per unit area. Is it the relevant unit when considering human emissions at a global scale? If a mitigation action lessens at the same time GHG emissions and crop productivity, leading to the need to increase surfaces (or even import food) in order to compensate the productivity loss, should it be considered as relevant? Shouldn't rather the intensity of emission be considered? I know there are arguments for both sides (see for example discussion by Lynch et al, Sustainibility, 3(2), 322-362 (2011)) but this point should be evoked in this section.	the comment will be further discussed and arguments analysed by authors	Marc Aubinet	University of Liege	Belgium
27151	45	10	59	15	I have the unpleasant feeling that these sections are biased: the publications that are aknowledged generally provide the largest mitigation potential estimates. Publmication that criticize these estimates, founding them too optimistic are ignored. At some places I noticed errors (?) that always lead to an overestimation of the potential; negative side-effects of the different actions are most of the time minimized (I give specific examples below in specific comments). This is critical because giving exagerated numbers would question the report credibility. It is also important to my opinion to state that, if agriculture presents a real mitigation potential, it is limited in amount and in time. By giving a too optimistic view of mitigation potentialities, I fear we are running the risk that policymakers concentrate their mitigation efforts on agriculture and put aside the emissions by industry and transport.	accept,Good comments. Sections will be re-organized	Marc Aubinet	University of Liege	Belgium
32937	45	10	63	9	From 7.5.3 onwards the structure of the section/subsections is confusing. It starts with agricultural interventions focusing on different production systems, followed by 'soil carbon sequestration' (which is a process across production systems). Subsequently 'conservation agriculture' receives an own subsection (but isn't it an agricultural intervention, too?), etc. I suggest to carefully review the structure and discuss mitgation along either production systems or techniques/mitigation measures, but not mixing both up. In that way overlaps are also avoided.	accept, Good comments. Sections will be re-organized	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
14901	45	4			Reference Leifeld and Menichetti 2018 is missing from the list of refernces	Reference has been added	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
21805	45	4			Menichetti, 2018	Reference has been added	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
29701	45	4			Leifeld and Menichetti 2018; Add this article to the reference	Reference has been added	RAEHYUN KIM	Institute	Republic of Korea
21807	45	8			Menichetti, 2018	Reference has been added	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
22705	45	8			Does the Leifeld paper quantify the potential for reductions in GHG? It would be good to put an amount in there. Restoring peatlands has great potential, esp in boreal Sweden and Finland, but this is a very short section	Accept, the section has been re-structured and revised and includes mitigation potentials	Melissa Lucash	Portland State University	United States of America
10459	45	10			Much of this section is written in a text book style, covering ground that has been well trodden in previous assessments. Please focus on what adds to or modifies the previous assessments, and ensure you come up with clear concluding statements on those issues. For each option, I'm looking for clear information on the mitigation option, its potential (and what factors might constrain this potential), and its cost and cost-effectiveness (for a given carbon price), and key issues for deployment. Right now these core questions are not addressed in any systematic way.	accept, Good comments. Sections will be re-organized	Andy Reisinger	NZAGRC	New Zealand
37451	45	10			Much of this section is repetitive, presumably because authors have been working separately on different sections. One overarching comment is that where potentials for differnet options (e.g. soil carbon sequestraton) are provided, the assumptions / methods behind such estimates should also be described, or the reasons for variation between estimates explained. There are several cases where a theoretical potential is provided, or an estimate of the total stock of carbon in a given pool is given, but while such information can be interesting, policy makers need to know what a more realistic estimate of potential carbon fluxes would be, and what would be required to achieve such flow volumes. They also need to know the vulnerabilities of these options, e.g. under what warming levels are the quoted potentials still valid? Will these diminish at higher levels of warming, or is this still uncertain because of CO2 fertilization effects / water availability	accept, Good comments. Sections will be re-organized	Michiel Schaeffer	Climate Analytics	Netherlands
29583	45	15			FAO 2016; Add this article to the reference	Noted. All references will be checked.	RAEHYUN KIM	Institute	Republic of Korea
29703	45	16			Lemaire, 2007; Add this article to the reference	Noted. All references will be thoroughly checked.	RAEHYUN KIM	Institute	Republic of Korea
29539	45	17			Borges et al. 2019; Add this article to the reference	Noted, thank you. References will be thoroughly checked.	RAEHYUN KIM	Institute	Republic of Korea
29785	45	26			Silveira et al. 2013; Add this article to the reference	Noted, thank you. All references will be checked.	RAEHYUN KIM	Institute	Republic of Korea
29603	45	28			Follett and Reed, 2010; this article to the reference	Noted, thank you. All references and associated listing will be checked.	RAEHYUN KIM	Institute	Republic of Korea
29667	45	29			Jeong et al. 2016; Add this article to the reference	Noted. References will be checked.	RAEHYUN KIM	Institute	Republic of Korea
29679	45	31			Khalil et al. 2019; Add this article to the reference	Noted.	RAEHYUN KIM	Institute	Republic of Korea
739	45	34			(Khalil et al. 2019) is not listed in the reference list	Noted, thank you. All references will be checked.	Rémi CARDINAEL	CIRAD	France
741	45	35			(Franzluebbers et al. 2014) is not listed in the reference list	Noted. The reference list will be checked.	Rémi CARDINAEL	CIRAD	France
29607	45	35			Franzluebbers et al. 2014; Add this article to the reference	Noted, thank you.	RAEHYUN KIM	Institute	Republic of Korea
29563	45	38			Coonan et al.2019; Add this article to the reference	Noted. All references will be checked following revisions.	RAEHYUN KIM	Institute	Republic of Korea

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
29711	45	38			Maia et al. 2009; Add this article to the reference	Thank you. The list of references will be checked.	RAEHYUN KIM	Institute	Republic of Korea
6853	45	42			Has the SOC defined?	Noted. During revision of the section, cognescance will be given to defining new terms.	Valasia Iakovoglou	International Hellenic University	Greece
29551	45	43			Chai et al. 2019; Add this article to the reference	Noted. All references and the associated listing will be checked.	RAEHYUN KIM	Institute	Republic of Korea
29897	45	43			Wang et al. 2018; Add this article to the reference	Noted, thank you.	RAEHYUN KIM	Institute	Republic of Korea
21809	45	44		45	The adoption of improved grazing management practices has the potential to reduce the adverse impacts of intensive farming on climate?this statement based on reserch or opinion?have data?	Accepted. This sentence will be changed as part of wider revisions planned for the entire section.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
15795	46	1	46	2	The Gomez-Casanovas quote is missing from the reference list at the end of the chapter.	Noted, thank you. All references and their correct listing will be checked.	EDUARDO PEDRO FRACASSI	ITBA Instituto Tecnologico de Buenos Aires	Argentina
27223	46	3	46	5	I don't agree with the comment that ha scale should be replaced by regional/continental assessments. Keeping values at ha scale, allows comparing the impacts of different managements. Averaging (on which basis? with which weighing?) would bias the results. Summing them at regional scale would blur the information by combining the numbers with the region surfaces.	Noted. This table will most likely be removed as part of wider changes planned for the section.	Marc Aubinet	University of Liege	Belgium
27225	46	3	46	5	It would be good to add the period duration on which SOC changes have been computed.	Accepted. Regrettably, this table will be removed as part of wider planned revisions to the section.	Marc Aubinet	University of Liege	Belgium
27221	46	3	46	7	Tables 7.5 is potentially interesting but should be clarified in order to improve readibility. Do these numbers corresponds to periods with continuous management?	Noted. The reviewer's suggestion will be considered if the table remains following wider revisions.	Marc Aubinet	University of Liege	Belgium
8567	46	4	46	4	The word "continenetal" needs to correct to "continental".	Accepted. The section will be revised, and the mentioned table caption removed.	Eun Jung Choi	National institute of agricultural sciences	Republic of Korea
38973	46	6	46	7	In the case of intensive management you get C sequestration but CO2 is released from fertilizers production and machinery use.	Noted. It is likely that this table will be removed as part of wider changes to the section. However, the reviewer's point is noted.	Vassilis Litskas	Cyprus University of Technology; Open University of Cyprus	Cyprus
12255	46		46		Table 7.5: This table must be referred, as the compiled information/table is taken from Khalil et al. (2019) i.e. Khalil, M.I., R. Francaviglia, B. Henry, K. Klumpp, P. Koncz, M. Llorente, E. B. Madari, M. Muñoz-Rojas and R. Nerger . 2019. Strategic management of grazing grassland systems to maintain and increase organic carbon in soils. In: CO2 Sequestration; L.A. Frazão, A.M.S. Olaya and J. Cota (Eds.). ISBN: 978-953-51-7187-4. IntechOpen Publishers, UK. p1-20. DOI: http://dx.doi.org/10.5772/intechopen.84341.	Noted. This table will most likely be removed as part of wider changes to the section.	Mohammad Ibrahim Khalil	University College Dublin	Ireland
26903	46	3	47	1	This table gives the impression that enhancement of C sinks go on forever, yet we know that changes in management practices eventually lead to new SOC equilibria levels. This needs to be communicated and the contents of the table need to be properly narrated, with all the necesaary caveats. It would be good to list the literature sources for each number for tracability and updates in subsequent ARs [I presume that is what the numbers in brackets are, but the references do not appear at the end of the table].	Accepted. The authors note the reviewer's comment. This table is likely to be removed in the second order draft.	Louis Verchot	International Center for Tropical Agriculture	Colombia
29005	46	3	47	5	Please don't just copy paste this table from IntechOpen something. (table 7.5, 7.6, 7.7)	Noted. These tables will most likely be removed as part of wider revisions to the section.	Marissa Malahayati	National Institute for Environmental Studies	Japan
29007	46	3	47	5	Is there no info about Asia (outside China) and Africa?	Noted. The table will be changed or removed during planned revisions.	Marissa Malahayati	National Institute for Environmental Studies	Japan
29009	46	3	47	5	Why you should separate it into 3 different table? You can write it as "Table 7.5 (cont.)" I think those table are the same, no?	Accepted. It is likely that these tables will be removed.	Marissa Malahayati	National Institute for Environmental Studies	Japan
29011	46	3	47	5	What is the meaning of value inside the brackets [....]?	Noted. The square brackets refer to references that were not finalised in the first order draft. This table will be removed in the second order draft.	Marissa Malahayati	National Institute for Environmental Studies	Japan
9291	46	1	48	6	I understand that the table is currently a placeholder - but I think a clear explanation of the calculation of LSU should be added here - or a reference provided. Do all three tables use LSU in the same manner? Does the LSU account for age/type livestock and if so what is the breakdown.	Accepted. It is likely that these tables will be removed for the second order draft. However, definition of LSU(s) will be included where appropriate.	Eamon Haughey	Trinity College Dublin	Ireland
9899	46	3	48	4	The figures in these tables are disturbingly high. For example, a recent assessment for France finds that the potential of improved grassland management averages at 0.2 tC/ha/yr (Pellerin et al., 2019). I cannot check the references for these tables (they are not provided) but I would recommend a cautious literature review and consistency check with other IPCC reports.	Noted. The authors note the reviewers points, however these tables are likely to be removed as part of wider planned revisions.	Valentin Bellassen	INRAE	France
27153	46	4	48	4	Number between brackets in Tables 7.5, 7.6 and 7.7 likely represent references. They should be aknowledged in the legend.	Accepted. This needs to be address, however, the tables are likely to be removed as part of wider changes to the section.	Marc Aubinet	University of Liege	Belgium
29621	46	1			Gomez- Casannovas et al. 2018; Add this article to the reference	Accepted. All references and associated listing will be checked.	RAEHYUN KIM	Institute	Republic of Korea
21813	46	3		7	Table 7.5 title and the conten is not simple, not easy to understand	Accepted. The table will either be revised or removed.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21811	46	3			Table 7.5 sould be mention in the text ...(see Table 7.5)	Accepted. The table will likely be removed as part of wider revisions and the text changed.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
745	46	4			"practices" instead of "pracices"	Noted. The table caption will be revised as part of wider revisions.	Rémi CARDINAEL	CIRAD	France
747	46	4			"continental" istead of "continenetal"	Noted and thank you.	Rémi CARDINAEL	CIRAD	France
3451	46	4			practices	Noted. The table caption will be changed and part of extensive revisions.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
3449	46	5		7	in table 7.5, HUI has no caption	Noted. This table will be revised.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
27231	47	1	47	3	I don't agree with the comment that ha scale should be replaced by regional/continental assessments. Keeping values at ha scale, allows comparing the impacts of different managements. Averaging (on which basis? with which weighing?) would bias the results. Summing them at regional scale would blur the information by combining the numbers with the region surfaces.	Accepted. This table and entire section will be extensively revised. However, it is intended that discussion will focus on regional mitigation but in a different format to the table currently presented.	Marc Aubinet	University of Liege	Belgium
27227	47	1	47	5	The table is potentially interesting but should be clarified. I don't understand on which basis is SOCr changes are computed. To my understanding, integrated farming would include both pastures for livestock and crops and a number of SOC change should be given for each of the surface type. Why is there only one bnumber and what does it represent exactly? Maybe the problem is the definition of "integrated farming"?	Noted. This table will most likely be removed as part of wider changes to the section. However, the reviewers points are noted.	Marc Aubinet	University of Liege	Belgium
12257	47		47		Table 7.6. This table must also be referred (see above under 7.5).	Noted. This table will be revised as part of wider changes to the section.	Mohammad Ibrahim Khalil	University College Dublin	Ireland
749	47	3			"practices" instead of "pracices"	Noted, thank you.	Rémi CARDINAEL	CIRAD	France
751	47	3			"continental" istead of "continenetal"	Noted, thanks you. The caption will be revised.	Rémi CARDINAEL	CIRAD	France
3453	47	3			practices	Noted. Thank you.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
14805	47				table 7.6, row 5, rate of fertilization/lime application should be given	Accepted. The entire table will be revised.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
26905	48	1	48	1	This table gives the impression that enhances C sinks go on forever, yet we know that changes in management practices eventually lead to new SOC equilibria levels. This needs to be communicated and the contents of the table need to be properly narrated, with all the necesaary caveats. It would be good to list the literature sources for each number for tracability and updates in subsequent ARs [I presume that is what the numbers in brackets are, but the references do not appear at the end of the table].	Noted. This table is most likely going to be removed as part of major revisions to the entire section.	Louis Verchot	International Center for Tropical Agriculture	Colombia
28083	48	1	48	2	practices instead of pracices and continental instead of continenetal	Noted, thank you.	Alix Frank Rodrigue Idohou	National University of Agriculture	Benin
27233	48	1	48	3	I don't agree with the comment that ha scale should be replaced by regional/continental assessments. Keeping values at ha scale, allows comparing the impacts of different managements. Averaging (on which basis? with which weighing?) would bias the results. Summing them at regional scale would blur the information by combining the numbers with the region surfaces. .	Noted. This table, along with the two preceding, related tables will be removed as part of major revisions planned to the section.	Marc Aubinet	University of Liege	Belgium
27229	48	1	48	4	I don't understand the meaning of this table: if it is associated to land use change, one should specify not only the current managemlent practices but also the preceding practices. Without this information, the numbers are without interest	Noted. This table will be completely revised.	Marc Aubinet	University of Liege	Belgium
248	48	8	48	24	This section is certainly not finished! It had to be developed according to their importance in overall emissions from AFOLU. Figures and tables showing emissions from regions and type of production should be included. Enteric fermentation. Even though is the only part developed in a paragraph it is not complete and should be expanded.	Noted. This subsection has be completed and will follow a revised template. Discussion on Ag. emission, including enteric fermentation, will be presented in Section 7.2.	Diego Morgavi	INRAE	France
20051	48	8	48	24	Animal management section is missing (the existing text is very short and not well written (focuses on a small aspect, results from a single paper)	Accepted. This section will be expanded and specific measures will discussed following a revised template	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
27157	48	8	48	24	At present, only benefits of the approaches are described. I think that for the "feeds and feeding management" section (not written yet) it is important to recall the limitation and risks linked to some practices. Changing livestock diets to mitigate enteric methane emissions has been proven to be effective in reducing CH4 but raises other problems that are not evoked here. The diet change may be operated either by replacing a part of the forage (cellulose) by other concentrates (fat or starch) or by introducing food additives that favour alternative metabolic ways to consume carbon hydrates. Replacing a part of the forage by other concentrates lead to partly renounce to the advantage of ruminants that are the sole living organisms able to transform forage(cellulose) in proteins (milk, meat) consumable by humans. In addition, these concentrates have to be produced elsewhere, which has an ecological cost (while forage is directly available in grasslands). There are also challenges for the administration of the compounds, especially to ruminants that are under extensive grazing conditions (Patra, 2016 ; Patra et al., 2017 ; Llonch et al., 2017) The introduction of food additives raises problems of toxicity or of animal welfare: supplementing with antimethanogenic agents or with electron (H+) acceptors emissions, disrupt the natural rumen function and their misuse could lead to rumen disorders and potential health and other welfare problems (Llonch et al 2017). In any way, a cost-benefit assessment of the mitigation options and carbon footprint analysis of the livestock products using an integrated life cycle assessment needs to be done before any CH4 mitigation effort can be put into practice. (Patra et al 2016). Ref : P. Llonch, M. J. Haskell, R. J. Dewhurst and S. P. Turner Review: current available strategies to mitigate greenhouse gas emissions in livestock systems: an animal welfare perspective Animal (2017), 11:2, pp 274–284 A.K. Patra (2016) Recent Advances in Measurement and Dietary Mitigation of enteric Methane emissions in Ruminants Frontiers in Veterinary Science, 3, 39 Amlan Patra, Tansol Park, Minseok Kim and Zhongtang Yu. Rumen methanogens and mitigation of methane emission by anti-methanogenic compounds and substances Journal of Animal Science and Biotechnology (2017) 8:13 DOI 10.1186/s40104-017-0145-9	Accepted. Feeding strategies will be included within the Enteric F. subsection, with the subsection following a revised layout. Emphasis will be placed on developments since the IPCC SRCCL, though scope for discussion may regrettably, be somewhat limited. However, the references mentioned will be included.	Marc Aubinet	University of Liege	Belgium
30959	48	8	48	26	the paragraph on animal husbandry is very short. Also consider that the use of biochar as an additive has shown improvements on the reduction of the emissions, see Schmidt HP, Hagemann N, Draper K, Kammann C. The use of biochar in animal feeding. PeerJ. 2019;7:e7373. Published 2019 Jul 31. doi:10.7717/peerj.7373	Accepted. The livestock section will be extended. The authors thank the reviewer for their suggestion regarding biochar. Consideration will be given to the inclusion of biochar.	Pietro Bartocci	University of Perugia	Italy
9901	48	10	48	10	As for Climate Smart Forestry (see comment above), more clarity is warranted. Here again, "good agricultural practices" boils down to a single practice, intensification. I would therefore remove "good" in the sentence (for other purposes than climate mitigation, intensification of beef cattle may not be a "good" thing.	Accepted. The mentioned term will be removed and the subsection, re-written	Valentin Bellassen	INRAE	France
46529	48	10	48	15	This is not an assessment of the literature, but reliance on one reference for the statements made; the assumption seems to be that livestock intensification is 'good' animal husbandry rather than assessing the literature more broadly. If methane emissions are lower per kg but the intensification means that more animals (and kg) are produced per ha per year, then it does not lower methane emissions. This section needs a more thorough assessment of the literature to take into account different systems and impacts.	Accepted. This subsection will be entirely re-written	Rachel Bezner Kerr	Cornell University	United States of America
9903	48	10	48	19	There is indeed some evidence that for meat production, intensification reduces emission per ton of meat. Two reviews (with much higher external validity than the Brazilian study currently quoted) come to this conclusion (Clark and Tilman, 2017; Nijdam et al., 2012) although (Pierrehumbert and Eshel, 2015) demonstrate that it is possible to design extensive cattle system with a lower climate impact than feedlots.	Noted. It is hoped that planned revision of the subsection will satisfy the reviewers' concerns.	Valentin Bellassen	INRAE	France
9905	48	10	48	19	One wonders why this review is restricted to meat production. There is also literature on the merit of intensification for milk production, although it is mixed: (Lambotte et al., submitted; O'Brien et al., 2014) finds that extensive farms are less impacting in Ireland while (Thomassen et al., 2008) finds that intensive farms are more climate-friendly. An explanation of this apparent paradox could be that extensification is more efficient only in already extensive systems where farmers possess a high know-how regarding grass and grazing management (Lambotte et al., submitted)	Noted. Discussion will be made more relevant to milk/dairy production. Revisions will aim to provide more balanced discussion on mitigation measures, with less emphasis on intensification.	Valentin Bellassen	INRAE	France
10461	48	10	48	19	The text seems to confuse mitigation of absolute emissions or of emissions intensity. Almost all cases of intensification result in increased absolute emissions. It is important that this is clarified, and linked back to broader policy responses that demonstrate that and under what conditions intensification can support a reduction of absolute emissions. This is particularly important because intensification usually also changes producer costs and product prices, which means that there may not even be a reduction in emissions below BAU if demand changes as a result of intensification. There is extensive literature on this and it would be very useful if this chapter, with its ambition to explore the mitigation potential more in the real world, were to address this issue.	Noted. The section will be completely revised. There will be less emphasis on intensification, and broader discussion on multiple mitigation approaches.	Andy Reisinger	NZAGRC	New Zealand
38847	48	10	48	19	Is this entire paragraph only related to the Amazonian biome example? Are there are biome examples? Again, what are 'good practices', and are those only 'good' for the Amazonian biome? Please clarify.	Noted. This section will be entirely re-written, with consideration of multiple and widely applicable mitigation measures.	Julian Reyes	Personal Capacity	United States of America

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
17827	48	10	48	24	Please consider this comment in revising the section: Emission intensity varies among species, by product and according to the system of production. In general, the higher is the level of productivity (output per unit of input) the lower the emissions per unit of product (FAO, 2010). Numerous studies have shown that, in general, ASF from animals reared in more intensive and specialized systems have a relatively lower carbon footprint per animal than those in extensive systems, and dairy products, eggs and meat from monogastrics have a lower footprint than meat from ruminants (Garnett et al., 2015). Ruminant systems operating at low productivity in Africa, South Asia, Latin America and the Caribbean are major contributors to GHG emissions (FAO, 2013a). In developing countries, industrial systems are less GHG intensive, and these are followed by mixed crop–livestock systems and by grazing systems (Herrero et al., 2012). However, extensive pigmeat and poultry systems have generally low GHG emissions per unit of output (FAO, 2013a). References FAO. 2010. Draught animal power... An overview. Rome http://www.fao.org/fileadmin/user_upload/ags/publications/draugth_ap_overview.pdf FAO. 2013a. Tackling climate change through livestock – a global assessment of emissions and mitigation opportunities http://www.fao.org/3/a-i3437e.pdf Garnett, T., Roos, E. & Little, D. 2015, Lean, green, mean, obscene...? What is efficiency? And is it sustainable? Food Climate Research Network Environmental Change Institute & The Oxford Martin Programme on the Future of Food, The University of Oxford. https://www.fcrn.org.uk/sites/default/files/fcrn_lmgo.pdf Herrero, M., Grace, D., Njuki, J., Johnson, N., Enahoro, D., Silvestri, S. & Rufino, M.C. 2012. The roles of livestock in developing countries. Nairobi, International Livestock Research Institute. https://www.ilri.org/publications/roles-livestock-developing-countries	Noted. This section will be entirely revised. There will be less emphasis on emission intensities, with the aim of discussing a range of mitigation options and assessing latest developments.	Hsin Huang	International Meat Secretariat	France
222	48	10	48	48	"Good management practices to lower methane emisisons" is not limited to the tropis, as implied herein. The discussion of animal practices and enteric methane is very supercifial and not comprehensive.	Accepted. The section will be entirely revised with the aim of presenting more holistic and comprehensive discussion	Karen A. Beauchemin	Agriculture and Agri-Food Canada	Canada
30601	48	13	48	19	Should discuss some of the potential negative externalities associated with intensification of lifestock systems. See Lam, Y., Fry, J. P., & Nachman, K. E. (2019). Applying an environmental public health lens to the industrialization of food animal production in ten low-and middle-income countries. Globalization and health, 15(1), 40.	Noted. The section will be revised, with less focus on intensification, while more general externalities will be mentioned.	Raychel Santo	Johns Hopkins Center for a Livable Future, Bloomberg School of Public Health	United States of America
12261	48	21	48	21	It is suggested, if possible, to add silage/Fodder production and their implications to GHG emisions and SOC stocks.	Noted. The livestock subsections principally concern enteric fermentation and manure management. Grassland SOC stocks will be covered in the soil subsection. Though silage will not specifically be discussed, fodder production will be briefly mentioned. It is hoped that this will be sufficient.	Mohammad Ibrahim Khalil	University College Dublin	Ireland
26907	48	24	48	24	Consider also the potential of nitrificaiton inhibition by some varieties of tropical forages like Brachiaria in reducing N2O emissions from deposited dung and urine when you expand this section (Subbarao PNAS 2009)	Accepted. Consideration will be given to the inclusion of alternative forage crops, such as *Brachiaria* , in the manure management subsection.	Louis Verchot	International Center for Tropical Agriculture	Colombia
250	48	30	48	30	? population growth is not unprecedented, what is unparalleled is the total number of humans on earth.	Accepted. This sentence will be changed.	Diego Morgavi	INRAE	France
46531	48	30	48	30	It is not just or even primarily population growth which is driving changes in land use. This is a problematic assumption which is found throughout this chapter.	Accepted this sentence will be changes as part of wider changes to the entire section.	Rachel Bezner Kerr	Cornell University	United States of America
12259	48		48		Table 7.7. This table must also be referred (see above under 7.5).	Noted. It is likely that this table will be removed as part of wider planned changes to the section.	Mohammad Ibrahim Khalil	University College Dublin	Ireland
46191	48	21	49	6	This introduction to integrated production systems might be too much. It can be moved to another place. Mention the coupling of C and N fluxes among the benefits of integrated systems.	Accepted. This subsection will be entirely rewritten.	Daniel Ortiz-Gonzalo	Department of Geosciences and Natural Resource Management, Faculty of Science, University of Copenhagen	Denmark
5921	48	26	49	30	Much of this is in chapter Introduction (or should be) so needs editing to avoid duplication	Accepted. This subsection will be re-written as part of wider changes to the entire section	Ralph Sims	Massey University	New Zealand
20647	48	26	49	39	How is this section supposed to differ from 7.5.7. I'm a little bit confused as to why integrated systesma re treaded both as an "Agricultural Intervention" (why not conservation agriculture?) and a mitigation measure in-and-of itself. If these are two qualitatively different forms of integrated systems, this should be made clear	Accepted. Discussion on integrated systems will be reviewed. The two mentioned sections will be combined.	Vassilis Daioglou	Copernicus Institute of Sustainable Development	Netherlands

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
32945	48	26	49	39	Clearly only 'copy/paste' from another document. Text doesn't fit into the section at all. I assume this will be revised for SOD.	Accepted. This entire section will be revised	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
3459	48	27	49	6	This paragraph sounds strange in this place. Could be put in 7.1.1?	Accepted. This introductory paragraph will be revised.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
25773	48	27	49	6	Examples of sentences that can be removed: these concepts are covered earlier in the chapter.	Accepted. This paragraph will be revised.	Helen Hughes	University of Edinburgh	United Kingdom (of Great Britain and Northern Ireland)
25775	48	27	49	39	The first and third paragraphs in this subsection do not appear to be discussing integrated production systems? This section should either be re-focused or removed (integrated production is discussed briefly in other areas).	Accepted. This section will be extensively reviewed with likely removal of certain paragraphs.	Helen Hughes	University of Edinburgh	United Kingdom (of Great Britain and Northern Ireland)
27155	48	27	49	39	This section does not address really the question of integrated production systems. The term "integrated production systems" itself should be defined (as is the case below for conservation agriculture, agroforestry or organic farming). The section only recalls generalities and, as it is, has no practical interest. I suppose that Table 7.6 could provide information that could give more substance to this section (but to allow this, the table itself should be clarified)	Accepted. This subsection will be completely revised. The relevance of the text and discussion will be reviewed, and proper definitions will be incorporated where appropriate.	Marc Aubinet	University of Liege	Belgium
27159	48	27	49	39	This section overlaps 7.5.7…(does it really? As far as integrated production systems are not clearly defined, it's difficult to say…)	Accepted. This subsection will be entirely re-written with the two sections mentioned will likely be combined.	Marc Aubinet	University of Liege	Belgium
21815	48	1		4	Table 7.7 title is too long and no info about source of data, and Table 7.7 not mention in the text	Accepted. This table will be completely revised.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
753	48	2			"practices" instead of "pracices"	Noted, thank you.	Rémi CARDINAEL	CIRAD	France
755	48	2			"continental" istead of "continenetal"	Noted and thank you.	Rémi CARDINAEL	CIRAD	France
3455	48	2			practices	Accepted. The table title and caption will be extensively revised.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
38845	48	10			What is "good" for an agricultural practice? Good can mean something different across scales, users, climates, management types, etc. A different qualifier should be used here.	This section will be completely revised and the term 'good' will be removed.	Julian Reyes	Personal Capacity	United States of America
29713	48	11			Mandarino et al. 2019; Add this article to the reference	The authors thank the review for the suggested reference. Consideration will be given to its inclusion.	RAEHYUN KIM	Institute	Republic of Korea
5919	48	13			Quoting costs, gross margins, rate of return etc to the nearest cent is nonsense for such analyses. Suggest round off to say something like "around $320".	Accepted. It is planned that the subsection will be entirely rewritten.	Ralph Sims	Massey University	New Zealand
3457	48	21		24	the paragraph is still missing	Noted. Two subsections concerning livestock production and mitigation will be developed.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
21817	48	21		24	need firther explanation	Noted. The subsections will be properly developed.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
10463	48	26			This section makes lots of general statements but fails to provide an assessment of the literature. In part this may be because the section doesn't seem to have a clear motivating question: what is it that this section wants to focus on? What is its policy-relevant conclusion?	Accepted. This section, the contained text, and indeed its relevance will be reviewed.	Andy Reisinger	NZAGRC	New Zealand
6855	48	27			Please reword properlly "Land and the resources it provides is fundamental for humanit"	Accepted. This sentence will be changed	Valasia Iakovoglou	International Hellenic University	Greece
29793	48	28			Steiner, 2018; Add this article to the reference	Noted. Thank you.	RAEHYUN KIM	Institute	Republic of Korea
9825	49	1	49	1	Further explain how these percentages have been evaluated (based on satellite imagery, national statistics). What is the definition of "Earth's land area" (eventually insert a footnote)?	Noted. This sentence, including reference to biomass productivity percentages, will be revised.	Jeanne Bormann	Ministry of agriculture	Luxembourg
17367	49	8	49	11	According to discussions held during COP25 and lack of international consensus in IPCC special report on the impacts of global warming of 1.5 °C above pre-industrial levels, the mentioned texts should appear to be reviewed.	Noted. This paragraph will be changed as part of wider planned changes to the section.	Zeyaeyan Sadegh	Islamic Republic of Iran Meteorological Organization (IRIMO)	Iran
25099	49	8	49	14	Delete "The IPCC Special Report … is delayed (IPCC 2019)."	Accepted. This paragraph will be re-written.	Eleni Kaditi	Organization of the Petroleum Exporting Countries (OPEC)	Austria

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
46875	49	15	49	16	This argument eventually should acknowledge the economic barriers of such systems, which basically have been the historical way of farming.	Noted. This paragraph will be entirely revised as part of wider changes. However, discussion on economic barriers will be included elsewhere (most likely in 7.6).	Martin Schönhart	University of Natural Resources and Life Sciences, Vienna	Austria
46877	49	15	49	16	Here, acknowledgement of the literature on "sustainable intensification" may be a helpful. A recent article by Pretty lists synonyms to this term (Pretty, J., 2018. Intensification for redesigned and sustainable agricultural systems. Science 362. eaav0294 (2018) 23 November 2018, page 1)	Noted. This will be considered and the authors thank the reviewer for the suggested reference.	Martin Schönhart	University of Natural Resources and Life Sciences, Vienna	Austria
22439	49	22	49	22	Change "depend" to "depends"	Accepted. This sentence (and word) will be changed.	Donald Smith	McGill University	Canada
94	49	25	49	25	Is agro-forestry a CDR approach? There is some overlap between mitigation and CDR activities. This should be discussed in the introduction of the chapter.	Noted. This paragraphs and indeed the entire section will be revised. Agroforestry will be covered elsewhere and reference to it here will be removed.	Govindasamy Bala	Indian Institute of Science	India
32037	49	25	49	26	(combining crops with trees for fuel and timber); crop-live systems; livestock-fish and rice-fish farming)'. I think from this list it is missing the incorporation of leys in arable rotations	Noted. This sentence will be revised.	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
6857	49	28	49	30	when the term international and national researchis used, is there a specific area that the authors refere in order to characterize it as national and internationa?	Noted. This sentence will be changed as part of wider planned changes to the section.	Valasia Iakovoglou	International Hellenic University	Greece
20053	49	28	49	30	A very important aspect is missing from this sentence: the land us implications of such practices, which often produce lower yield than 'conventional' practices. I think it would be a very sueful addition is this debate could be expanded and substantiated with a range of sources, covering the regional differences.	Noted. This subsection will be entirely revised. The reviewer's point concerning yield impacts will certainly be taken into consideration	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
9295	49	28	49	39	Terminology issues - in line 28 - 29 the statement 'agro-ecological farming and livestock systems, including regenerative, organic, sustainable, conservation agriculture, sylvopasture and agroforestry,' contains many terms which may not be familiar to the gernal audience of policy makers. Government delegations will seek consistency and also definition of terms in the glossary. In the later part of the paragraph all of the aforementioned terms are referred to as 'climate smart agriculture' however I don't think that is strictly true since climate smart could also be intensively managed (would possibly be better to use 'agroecological approaches'). Therefore for clarity around terms I would suggest harmonisation across the chapter and the SRCCL glossary may help.	Noted & accepted. Revision of this entire subsection is planned. Proper definitions will be provided with reference to the SRCCL glossary. The authors thank the reviewer for the suggested use of 'agroecological approaches'	Eamon Haughey	Trinity College Dublin	Ireland
30603	49	28	49	39	Some more attention should be given to some of the limitations of the carbon sequestration potential of livestock farming systems - e.g., under specific soil, climate, and animal density conditions, well-managed livestock grazing may sequester carbon, but this potential is small, time-limited, reversible, and substantially outweighed by the GHG emissions generated by grazing systems (Garnett, T. et al. (2017). Grazed and confused? Ruminating on cattle, grazing systems, methane, nitrous oxide, the soil carbon sequestration question – and what it all means for greenhouse gas emissions. Oxford: Food Climate Research Network)	Nothed. This paragraph will be completely revised. The reviewers comments will be taken into account during revisions. The authors also thank the reviewer for the suggested reference	Raychel Santo	Johns Hopkins Center for a Livable Future, Bloomberg School of Public Health	United States of America
46533	49	28	49	39	Good to see that these alternative approaches are mentioned but more specific definition of terms like agroforestry and agroecology, and more assessment of literature needed here. (Regenerative agriculture, for example, is not the same as agroecology or agroforestry). This report gives an overview of agroecological approaches: HLPE. 2019. Agroecological approaches and other innovations for sustainable agriculture and food systems that enhance food security and nutrition. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome.	**R. Mrabet, C. Mbow, S. Roe & J. Emmet-Booth**	Rachel Bezner Kerr	Cornell University	United States of America
12263	49	30	49	32	I think, this sentence should be clear enough and it helps further if incudes "in part in terms of global context and the associated sources'.	Noted. The mentioned sentence will be revised.	Mohammad Ibrahim Khalil	University College Dublin	Ireland
6859	49	32	49	32	Please correct the extra parenthesis " (Smith et al. (2019a)"	Accepted. All punctuation will be thoroughly revised.	Valasia Iakovoglou	International Hellenic University	Greece
22175	49	32	49	32	Placement of a fore-bracket punctuation marck	Noted. All punctuation will be thoroughly revised during editing of the text.	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
22437	49	32	49	32	Change "migate and adapt" to "mitigation and adaptation"	Noted. The precise words mentioned could not be located in the text. However the entire paragraph will be revised.	Donald Smith	McGill University	Canada
25101	49	32	49	35	Replace "In order to achieve … these technique" with "Negative emission technologies (NET)"	Noted. This sentence will be changed as part of wider changes to the entire subsection.	Eleni Kaditi	Organization of the Petroleum Exporting Countries (OPEC)	Austria
22177	49	33	49	33	Subscript on CO2	Noted. Thank you.	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
22441	49	33	49	33	Change "technique" to "techniques"	Noted. Thank you. This sentence will be changed.	Donald Smith	McGill University	Canada
22443	49	33	49	33	Subscript "2" of "CO2"	Accepted. Thank you.	Donald Smith	McGill University	Canada

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
28085	49	33	49	33	for CO2, 2 should be considered as index	Noted. This will be changed.	Alix Frank Rodrigue Idohou	National University of Agriculture	Benin
32039	49	33	49	33	check subscript in CO2	Noted. Thank you.	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
22445	49	35	49	35	Change "technique" to "techniques"	Accepted. This sentence will be re-written.	Donald Smith	McGill University	Canada
9827	49	35	49	37	Incomplete sentence.	Noted. This sentence will be rewritten as part of wider changes to the subsection.	Jeanne Bormann	Ministry of agriculture	Luxembourg
12265	49	48	49	52	As stated earlier, it is preferred to calculate net C storage by weight of SOC per unit area instead in order to see the real potential of particular management to increase C density per unit basis	Accepted. This sentence will be revised.	Mohammad Ibrahim Khalil	University College Dublin	Ireland
22447	49	50	49	50	Change "to" to "to a"	Accepted. This will be revised.	Donald Smith	McGill University	Canada
38975	49	50	49	52	We need much more than Lal et al. (2018) in order to design C sequestration schemes. If available please add. Also, how many years do we need to add this amount of C in the soils?	Noted. This subsection will be extensively revised.	Vassilis Litskas	Cyprus University of Technology; Open University of Cyprus	Cyprus
27163	49	51	49	52	What do mean the number in parenthesis? The numbers in PgC are not the result of the product of these numbers. I would skip them	Noted. This sentence will be changed as part of planned revisions to the entire subsection.	Marc Aubinet	University of Liege	Belgium
27165	49	51	49	52	The numbers should be given with their uncertainty : 155 Pg is indeed 94-216 and 178 Pg is 209-458 (Lal et al. 2018)	Accepted. This will be considered during wider revision of the section.	Marc Aubinet	University of Liege	Belgium
27167	49	52	49	52	The drawdown of atmospheric CO2 by 156 ppm does not result from soil sequestration only but from all LU actions (Lal et al 2018). Giving this number in this section is misleading. The number of 22 ppm given by the same author and cited below (P50L22) is more appropriate.	Noted. This will be revised.	Marc Aubinet	University of Liege	Belgium
12267	49	54	49	54	To make clear the C storage per unit 'SOC density' and thereby its total at national/regional/global level 'SOC stocks' should be used where appropriate and throughout.	Noted. This will be taken into consideration during revisions.	Mohammad Ibrahim Khalil	University College Dublin	Ireland
759	49	54	50	1	I would be less affirmative concerning the positive effect of SOC on the water holding capacity of soils. See for instance this recent meta-analysis: Minasny, B., McBratney, A.B., 2018. Limited effect of organic matter on soil available water capacity. Eur. J. Soil Sci. 69, 39–47. doi:10.1111/ejss.12475	Noted and thank you. This will be considered as revisions to the entire section take place.	Rémi CARDINAEL	CIRAD	France
46883	49	42	51	9	Eventually highlight the feedbacks from climate change with both eventually higher biomass growth rates and SOC decay and release in some regions.	Noted. This is a good point and will be considered for the second order draft.	Martin Schönhart	University of Natural Resources and Life Sciences, Vienna	Austria
9293	49	42	51	13	(1) The issue of soil carbon saturation is mentioned in this section. Given the importance of this (and policy relevance) based on SRCCL - SPM and Ch6 would it be possible to add more information. One key aspect is the difference between soil carbon saturation rates in mineral soils and organic (peat) soils. Peatlands may continue to sequester carbon for millennia and it would be useful to differentiate. (2) For both mineral and organic soils the potential to sequester and retain carbon is also key - so sink reversibility might be relevant here. SRCCL Ch4 produced a diagram on this topic Figure 4.1., which illustrates the issue of potential reversibility of soil (and biomass) carbon sinks through poor management.	(1) noted and accepted. A substantial revision is planned for this entire section. Regrettably, part of this plan is the shorten the text. However this point will be considered when reviewing the section. (2) Again noted and this will be considered when revising the section.	Eamon Haughey	Trinity College Dublin	Ireland
27347	49	42	51	13	This subchapter does not well fit to the flow, SOC changes are addressed in several other places, etc. A revised structure is required here. The passage could also profit from a improved assessment style.	Accepted. Extensive revision of the entire section is planned, with the aim of preventing repetition and improving flow.	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
46193	49	42	51	13	Perhaps include paragraph on the discussion on subsoil carbon dynamics in deeper layers of soil. See for example Tautges et al., (2019). Or Lal, R. (2018).	Noted and thank you for this suggestion. This will be considered when revising the section.	Daniel Ortiz-Gonzalo	Department of Geosciences and Natural Resource Management, Faculty of Science, University of Copenhagen	Denmark
27161	49	42	51	14	This section looks biased and overlooks many aspects of the soil carbon storage issue. It could give the impression that GHG emissions by fossil fuel could be compensated by agriculture and free the industrialists and oil gas producers from reduce their emissions. As the IPCC report has to present a complete view of the state of the art in science, they should not ignore there is a debate among scientist about the credibility of soil carbon storage feasibility In particular, arguments presented by Baveye et al (Geoderma, 309, p118-123; 2018) and citations herein should be aknowledged. In particular (i) soil carbon sequestration is limited in time as the sink saturates ; (ii) further increase in temperature will enhance microbial activity and decrease the amount of SOC, limiting the possibility of C storage; (iii) some carbon storage practices could lead to increased emissions of other GHG gases; (iv) priming effect could limit the storage potentialities. Other references : Poulton et al (Global Change Biol, 24, 2563-2584),Batjes et al (Land Degradation and development, 30, 25-32)	Noted and accepted. Extensive revision of the section is planned, with regrettably, need to shorten the text. However, these points will be taken into consideration. The authors also thank the reviewer for their suggested references.	Marc Aubinet	University of Liege	Belgium
33137	49	44	51	10	Need to mention soil organic carbon found in cultivated wetlands. In Kenya and Africa in general, these type of land use occupy significant areas that are important farming areas for water dependent crops such arrowroots.	Noted. Extensive revision is planned for the section, including new sections specifically on wetlands. Nonetheless, the reviewers point will be considered during revision of this section.	George Gatere Ndiritu	University	Kenya

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
39789	49	44	51	13	It should be stated that this section refers only to organic C; the section could lead to confusion as the terms C, SOC, organic matter are used somewhat interchangably. It would be helpful tonstart by defining C as including both organic C (about which much is known) and inorganic C (about which less is known), and that soil organic matter includes elements other than C, especially H, N and O, and so is not interchangeable with organic C. The long-known occurrence of pedogenic carbonates (especially if soils are considered to 2m depth) adds a stock and can be manipulated artificially to boost soil inorganic carbon contents.	Accepted. The use of abbreviations, an their appropriate definition, will be reviewed during revision of the entire section.	David Manning	Newcastle University	United Kingdom (of Great Britain and Northern Ireland)
18043	49	44	51	54	Please consider this comment in revising the section: Furthermore, the use of such a significant land area through grazing implies that carbon sequestration is more relevant than previously thought (Dass et al 2018, Stanley et al 2018 and Viglizzo et al 2019) the same applies to agroforestry (Cardinael et al. 2018). These systems enhance soil fertility, prevent soil erosion, are beneficial to biodiversity and in the case of agroforestry improve income of farmers derived from wood and livestock grazing the pastures sown within the forest (Cardinael et al 2018). An estimate for the UK showed that taking into account grassland sequestration, cattle and sheep account for 3.7% of total UK emissions, but excluding grassland sequestration, they account for 5.7%. (UK Department for Business, Energy and Industrial Strategy/National Statistics, 2019). References Cardinael, R., V. Umulisa, A.Toudert, A. Olivier, L.Bockel and M. Bernoux 2018. Revisiting IPCC Tier 1 coefficients for soil organic and biomass carbon storage in agroforestry systems. Environ. Res. Lett(2018) 124020 https://doi.org/10.1088/1748-9326/aaeb5f Dass, P., B.Z. Houlton, Y. Wang and D. Warlind.2018. Grasslands may be more reliable carbon sinks than forests in California. Environ, res Lett 13(2018)074027 https://doi.org/10.188/1748-9326/aach39 Stanley P.L., J.E. Rowntree, D. K. Beede, M. S. Delonge and M.W. Hamm, 2018. Impacts of soil carbon sequestration on life cycle greenhouse gas emissions in Midwestern USA beef finishing systems. Agricultural Systems 162 (2018) 249-258 https://doi.org/10.1016/j.agsy.2018.02.003 UK Department for Business, Energy and Industrial Strategy/National Statistics, 2019. Final UK greenhouse gas emissions national statistics: 1990-2017, March. https://www.gov.uk/government/statistics/final-uk-greenhouse-gas-emissions-national-statistics-1990-2017 Viglizzo E.F.,M.F.Ricard, M.A.Taboada and G. Vazquez-Amabile 2019. Reassessing the role of grazing lands in carbon-balance estimations: Meta-analysis and review. Science of the Total Environment 661 (2019) 531-542	Noted. The authors thank the reviewer for their suggested text and references. Substantial changes to the subsection are planned as part of wider revisions to the entire section. The reviewer's comment will be considered during this revision process.	Hsin Huang	International Meat Secretariat	France
27625	49	42	52	42	Soil can capture more carbon. I suggest to add references on 1) mulching 2) use of wood as cover for soil 3) Use of plants with carbon storing roots, 4) high efficiency compsting and/or to appoint experts in these fields to report on the additional possibilities . Here are some references on these techniques:) https://www.ncbi.nlm.nih.gov/pubmed/30602238 J Environ Manage. 2019 Feb 1 Mulching-induced preservation of soil organic matter quality in a burnt eucalypt plantation in central Portugal. Soil mulching significantly enhances yields and water and nitrogen use efficiencies of maize and wheat: a meta-analysis 2) Lemieux G (1988) L'importance du bois raméal dans la" synthèse" de l'humus ; novembre 1988 (deuxième édition 1992) ; Publication nº 11, édité par le Groupe de Coordination sur les Bois Raméaux ; Université Laval (Département des Sciences du Bois et de la Forêt), Québec Rey F, Breton V, Meistermann S & Crozas Y (2009). Le bois raméal fragmenté (BRF) en végétalisation pour la lutte contre l'érosion de surface [archive]. 3) for example papyrus has large, carbon storing underground part see also Biomineralization in plants as a long-term carbon sink. Cailleau G, Braissant O, Verrecchia EP. Naturwissenschaften. 2004 Apr;91(4):191-4. Epub 2004 Mar 13. 4) On high efficiency composting: Les enjeux internationaux du compostage, Bernard K. Martin edition Harmattan http://www.editions-harmattan.fr/index.asp?navig=catalogue&obj=livre&no=8007	Noted. The authors thank the reviewer for their suggested text and references. There are plans to revise the entire section, and this suggested material will be considered during the revision process.	Dorota Retelska	Independent	Switzerland
43311	49	1	53	10	so much attention (pages and figures) to soils, and agriculture., and yet figure 7.16 shows that ag/soils have much smaller potential than forests. There seems to be no systematic look at forests and forest mitigation potential; no regional comparison of potential across various forest activities. forest content covers only a few pages (42-45) not at all commensurate with the potential importance of forests. I think the amount of text devoted to a topic should match the importance rather than where the most literature is.	Noted. It is planned that some discussion will be included in revised sections on afforestation / reforestation.	Deborah Lawrence	University of Virginia	United States of America

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
3461	49	1		24	What is the period?	Noted. This sentence will be changed as part of wider planned changes to the subsection.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
29523	49	19			Andrade et al. 2014; Add this article to the reference	Accepted. Thank you.	RAEHYUN KIM	Institute	Republic of Korea
46879	49	19			Andrade et al., 2014: reference missing	Noted. Thank you.	Martin Schönhart	University of Natural Resources and Life Sciences, Vienna	Austria
757	49	25			"crop-livestock" instead of "crop-live"	Accepted. This sentence (and term) will be revised.	Rémi CARDINAEL	CIRAD	France
3463	49	25			meaning of CDR measures not explained before	Noted. This section will be extensively changed and proper definition of terms will be included.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
10465	49	42			This section seems to overlap strongly with the preceeding section on grassland management. Suggest soil carbon is hamonised and discussed in one place only - or that there are separate sections on grassland management, cropland management etc but not separately on soil carbon. It would be important though for this chapter to provide a clear assessment conclusion of the technical, economic, and real-world potential of soil carbon sequestration. There is a lot of policy interest in this (and a lot of claims) so it is critical for IPCC to speak to this issue. As it stands though, all I'm getting is table 7.8 which has wildly divergent numbers. That may be the case - but therefore what does the IPCC conclude on the potential of soil C sequestration as mitigation option? (Note table 7.8 also lacks any information on how long the stated sequestration rates could continue for, and/or how they would take to build up to those rates, and at what costs (these are technical potentials, right?) - so this section is the beginning of a literature review, but not an assessment)	Accepted. The two mentioned subsections will be harmonised along with an extensive revision of the entire section. There will be greater emphasis on assessment of literature along with technical and economic mitigation potential.	Andy Reisinger	NZAGRC	New Zealand
3465	49	50		52	Could be presented in the section 7.2 also	Noted. It is hoped that planned extensive revisions satisfy the reviewer's comment.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
20175	49	50		52	Evidently, the technical mitigation potential is of little practical significance.	Accepted. Planned revisions to the section aim to emphasise difference between technical and realistic potential.	Henry Neufeldt	UNEP DTU Partnership	Denmark
32947	50	2	50	5	This statement requires references and also explanation on the processes how increased organic matter increases yields and yield stability.	Accepted. This sentence / passage will be changed as part of wider, planned changes to the section.	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
22449	50	3	50	3	"Some evidence" is an understatement. In the field, nothing works all the time, however, the evidence to support this statement is actually very strong.	Accepted. This sentence will be changed, as part of planned revision of the entire section.	Donald Smith	McGill University	Canada
22451	50	3	50	3	Change "by" to "with"	Accepted. The sentence will be changed.	Donald Smith	McGill University	Canada
761	50	3	50	4	I would cite this reference here: Oldfield, E.E., Bradford, M.A., Wood, S.A., 2019. Global meta-analysis of the relationship between soil organic matter and crop yields. SOIL 5, 15–32.	Noted. The authors thank the reviewer for the suggested reference, which will be considered.	Rémi CARDINAEL	CIRAD	France
6861	50	3	50	5	Please add citations.	Accepted. References will be added as required.	Valasia Iakovoglou	International Hellenic University	Greece
32949	50	9	50	12	Most of the references are missing in the reference list.	Noted. All references and associated listing will be checked.	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
27615	50	10	50	10	Reference missing in chapter 7 bibliography: Mouratiadou et al. 2016	Noted and thank you. The list of references will be updated.	Dorota Retelska	Independent	Switzerland
27617	50	11	50	11	Reference missing in chapter 7 bibliography: Sanchez et al. 2017	Noted. References will be checked and listed accordingly.	Dorota Retelska	Independent	Switzerland
27619	50	11	50	11	Reference missing in chapter 7 bibliography: Pereira et al 2010	Noted, thank you.	Dorota Retelska	Independent	Switzerland
27621	50	11	50	12	Reference missing in chapter 7 bibliography: Nemet et al 2018	Noted. All references will be checked.	Dorota Retelska	Independent	Switzerland
39791	50	12	50	13	This is the most important sentence in the chapter! Can you highlight it?	Noted. Revision of the entire section is planned, however, consideration will be given to highlighting this sentence / concept as appropriate.	David Manning	Newcastle University	United Kingdom (of Great Britain and Northern Ireland)

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
32951	50	12	50	15	Quite unnuanced statement and partly inconsistent with what has been said in one of the previous sections (i.e., forest interventions are most practical and cost-effective). A list of 'best management practices' including their suggested sequestration potentials (ideally divided by regions and environmental conditions) should be included.	Accepted. The statement will be changed as part of broader revisions to the section. Revisions will aim to provide discussion on best management and mitigation potential by region.	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
22453	50	13	50	13	Change "tons" to "tonnes"	Noted. This will be changed	Donald Smith	McGill University	Canada
1009	50	13	50	15	Text reads: “Farmers and landowners can sequester tons of C per hectare in soil and perennial biomass through best management practices for soil health, crop and livestock production, and agroforestry.” This is misleading. Most examples of annual rates of C sequestration through altered agricultural management (as opposed to land use change) are less than 1 t per ha.	Noted. This sentence will be revised as part of wider planned changes to the section.	David Powlson	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
17931	50	13	50	15	Best practises such as? It is unclear in the following section whether industrial or agroecological approaches are supported, or whether you don't consider these to be contradictory. I think it is important to at least mention potential incompatibility of these approaches with each other, and significant tension and controversy regarding which might be 'better'. It is not necessary to 'pick a side' but I think at least acknowleding this ongoing debate is important, as you have presented the benefits of each. Is your implication that both can be adopted in different areas, without needing to go all in on either approach? This is not clear. Are you classing e.g. conservation agriculture as part of 'intensification'? (p.50 line 25). This is unclear, and what others would consider a fundamentally opposite system are discussed p. 51 from line 31 without discussion of how you consider these systems interacting either conceptually or in practise. A useful reference could be: http://www.fao.org/3/ca5602en/ca5602en.pdf such as page 63.	Noted. This passage will be revised, as part of wider planned changes to the section. Best management will be defined, while conclusions on what Ag. system approaches are appropriate or 'best', will be considered. The authors thank the reviewer for the suggested reference.	Luke Spajic	University of Adelaide (graduate student researcher), University of Oxford (visiting student researcher)	Australia
32953	50	15	50	16	Same here. The amount of GHG emitted depends on much more than just the 'system of management'. For example, the climate conditions, the efficiency of management (e.g., fertilizer, pesticide application), the social-ecological context, etc.	Accepted. This sentence will be changed.	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
44637	50	22	50	22	I wonder whether the IPCC should really go with the term "natural climate solutions" (popularized by Griscom et al.) since calling a solution 'natural' usually serves to gain a certain comparative advantage vis-a-vis seemingly 'unnatural' approaches (see https://www.nature.com/articles/s41558-019-0661-z).	Noted. The inclusion and use of the term 'natural climate solutions' will be considered.	Oliver Geden	German Institute for International and Security Affairs	Germany
27173	50	22	50	27	This paragraph is not at its place: NCS does not concern soil carbon storage only. This engenders confusion.	Accepted. This subsection will be extensively revised.	Marc Aubinet	University of Liege	Belgium
32955	50	22	50	27	If this section is about 'soil carbon sequestration' these paragraphs don't fit at all, as it makes very general statements about the GHG emissions reduction potential and carbon removal of land management.	Accepted. The subsection will be revised as part of a revision of the entire section.	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
46535	50	25	50	27	This sentence seems to assume that improved land management involves intensification, citing one study. This is a point of considerable scientific debate which should be reflected in the chapter. Other scientific studies argue that 'land sharing' approaches rather than intensification are more effective land management methods for having multiple benefits including mitigation. See for example Kremen, C. and A. M. Merenlender, 2018b: Landscapes that work for biodiversity and people. Science, 362, eaau6020, 56 doi:10.1126/science.aau6020.	Accepted. The sentence will be changed as part of wider planned changes to the section. However, the authors note the reviewers point and thank them for the suggested reference.	Rachel Bezner Kerr	Cornell University	United States of America
27171	50	29	50	36	The number of 11 PgCO2e given by Griscom does not concern soil carbon sequestration only but all NCS. The major part of carbon sequestration is made in forests and not in soils. Giving this number in this section is therefore misleading	Accepted. This sentence will be changed.	Marc Aubinet	University of Liege	Belgium
22455	50	33	50	33	Change "effecitvenesss" to "effective"	Noted, thank you.	Donald Smith	McGill University	Canada
27169	50	33	50	33	This number is considered by many authors as excessively optimistic. Giving only this one may be biasing. I suggest to add the estimate by Schlesinger and Amundson (cited below) who consider that all soil carbon accumulation techniques are not likely to balance more than 5% of annual emissions of CO2 from fossil fuel combustion.	Accepted. This sentence and section will be revised to present a balanced review of difference estimates.	Marc Aubinet	University of Liege	Belgium
44639	50	33	50	33	I wonder whether the IPCC should really go with the term "natural climate solutions" (popularized by Griscom et al.) since calling a solution 'natural' usually serves to gain a certain comparative advantage vis-a-vis seemingly 'unnatural' approaches (see https://www.nature.com/articles/s41558-019-0661-z).	Accepted. The use of the term will be considered.	Oliver Geden	German Institute for International and Security Affairs	Germany
22457	50	38	50	38	Change "the scientific knowledge to enhance" to "scientific knowledge regarding enhancement of "	Accepted. This sentence will be revised.	Donald Smith	McGill University	Canada
44641	50	38	50	38	I share the cautious perspective on the political feasibility of SCS, but this kind of consideration is missing for most of the other method-specific sections in 7.5, and I guess that's not mainly because there aren't similar concerns or there's no literature. Another option would be to shift all this into 7.7, and discuss it more generally in the context of barriers to implemantion, or more generally looking at the huge mismatch between technical potentials and respective realisation:	Accepted. Major revision of the section is planned. Mitigation potential will be discussed here while feasibility & barriers will feature designated policy section.	Oliver Geden	German Institute for International and Security Affairs	Germany

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
1011	50	38	50	44	. In citing papers urging caution about the quantities of soil C that can practically be sequestered through altered management of land, I suggest including a citation to Poulton et al (2018) “Major limitations to achieving 4 per 1000 increases in soil organic carbon stock in temperate regions: evidence from long-term experiments at Rothamsted Research, UK.” Global Change Biology 24, 2563-2584. https://doi.org/10.1111/gcb.14066 . This paper analyses rates of C sequestration within arable cropping systems and has been widely cited. It shows that it is extremely difficult to attain the 4 per mille rate of increase without very major changes in management or land use that would have severe practical, financial or infrastructural barriers.	Accepted. The entire section will be revised, including discussion on C storage capacity. The authors thank the reviewer for he suggested reference.	David Powlson	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
26909	50	38	50	44	Rather than just provide a biophysical perspective of what increasing SOC could do, it would be worthwhile examining the barriers to adoption of C sequestration approaches. There is a literature on this	Accepted. Barriers to adoption & general feasibility will be covered in a revised policy section.	Louis Verchot	International Center for Tropical Agriculture	Colombia
32487	50	38	50	44	Over 35 countries and dozens of organizations have signed on as members of the 4 per mille initiative. Financing partners include the French Ministry of Agriculture and Food, the German Federal Ministry of Food and Agriculture, and the Spanish Ministry of Agriculture. See https://www.4p1000.org/sites/default/files/content/tableau_partenaires_et_membres_16_novembre_2017.pdf. Many countries include carbon sequestration in agriculture and forest systems in their NDCs to the Paris Agreement. Only eight nations (Armenia, Burkina Faso, China, Japan, Malawi, Namibia, Uruguay and Zambia) explicitly set targets for soil organic carbon in their NDCs. However, many other countries support stronger action. See Vermuelen et al. (2019), A global agenda for collective action on soil carbon, Nature Sustainability (“Under the UNFCCC, only eight Nationally Determined Contributions (NDCs) present targets for soil organic carbon within their intended mitigation options (Armenia, Burkina Faso, China, Japan, Malawi, Namibia, Uruguay and Zambia). Yet many countries have policies that support stronger action, ranging from Canada, which recognizes the potential of soil organic carbon under conserved forests and wetlands, to Bhutan, with its sustainable soil policy.”). Australia’s Carbon Farming Initiative created a voluntary offset scheme to incentivize carbon sequestration in farms. The initiative’s fund has awarded over $100 million in contracts to landholders and farmers to implement a wide range of projects including rotational grazing and reduced tillage. See Vermuelen et al. (2019), A global agenda for collective action on soil carbon, Nature Sustainability (“Early adopters of market-based approaches to raising soil organic carbon include Australia and California. Australia’s Carbon Farming Initiative, a legislated voluntary offsets scheme implemented by the Emission Reduction Fund, has awarded contracts with an approximate value of A$200 million to landholders and farmers to earn carbon credits from soil organic carbon projects on degraded land, supporting a wide range of activities from rotational grazing to reduced tillage. Credits are paid on the basis of measured results: verified increases in soil organic carbon over a ten-year period11. Farmers’ returns from productivity increases are around four times the value of the credits (M.W., manuscript in preparation”).	Noted. The authors thank the reviewer for pointing this out. The paragraph in question will be revised as part of extensive revisions of the entire section. In addition, the suggested material is appropriate to a new revised policy section. These points will passed on to the relevant authors.	Durwood Zaelke	Institute for Governance & Sustainable Development	United States of America
32489	50	38	50	44	In China, economic and policy changes drove increased soil sequestration in croplands from 1980 to 2011. Over that period, soil organic carbon increased by about 0.5 tonnes of CO2 equivalent per hectare per year (more than 15 tonnes total). Two driving policy factors that led to this increase were a ban on straw burning on agricultural lands and strengthening of policies to return crop residues to the soil. See Zhao, Y. et al. (2018), Economics- and policy-driven organic carbon input enhancement dominates soil organic carbon accumulation in Chinese croplands, PNAS (“Based on the soil sampling locations recorded by the Second National Soil Survey of China in 1980, we collected 4,060 soil samples in 2011 from 58 counties that represent the typical cropping systems across China. Our results showed that across the country, the average SOC stock in the topsoil (0–20 cm) increased from 28.6 Mg C ha−1 in 1980 to 32.9 Mg C ha−1 in 2011, representing a net increase of 140 kg C ha−1 year−1.).	Noted. The section in question will be extensively revised, but as mentioned regarding a previous comment by the same reviewer, the suggested content will be very relevant to a newly developed policy section.	Durwood Zaelke	Institute for Governance & Sustainable Development	United States of America
22459	50	40	50	40	Change "cautious" to "cautions"	Accepted. This will be changed.	Donald Smith	McGill University	Canada
20649	50	40	50	42	It would be great if some of the reasons authors have been cautious about soil carbon sequestration were outlined. The current sentence is not very informative and serves only to tease. Or is it refering to the "saturation" issue mentioned in the following paragraph?	Accepted. This sentence and paragraph will be revised.	Vassilis Daioglou	Copernicus Institute of Sustainable Development	Netherlands
27175	50	40	50	42	This should be expanded. There is a scientific debate about the real potential of soil carbon sequestration that is not conveyed here.	Noted. The paragraph will revised as part of wider revisions of the entire section.	Marc Aubinet	University of Liege	Belgium
30605	50	40	50	42	Discuss more of these authors' cautions about the carbon sequestration potential.	Noted. The paragraph will be revised.	Raychel Santo	Johns Hopkins Center for a Livable Future, Bloomberg School of Public Health	United States of America
38641	50	46	50	46	It is better to say the scope of what "anthropogenic GHG emissions" here or saying the C sequestation potential first in this section and finally state the saturation issue. Because the current first paragraph gives us an impression that soil C sequestration seems useless in the context of climate change.	Noted. This paragraph will be revised as part of extensive revisions to the section.	Atsushi Sato	Mitsubishi UFJ Research and Consulting Co.,Ltd.	Japan
22461	50	51	50	51	Change "" to ""	Noted, thank you.	Donald Smith	McGill University	Canada
22463	50	51	50	51	Change "ton" to "tonne"	Accepted. This will be changed.	Donald Smith	McGill University	Canada

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
1013	50	52	51	2	The reference to Minasny et al (2017) in relation to achieving the 4 per mille rate of annual soil C sequestration does not take account of criticisms of this paper pointing out significant limitations. Examples include: to Poulton et al (2018) “Major limitations to achieving 4 per 1000 increases in soil organic carbon stock in temperate regions: evidence from long-term experiments at Rothamsted Research, UK.” Global Change Biology 24, 2563-2584. https://doi.org/10.1111/gcb.14066 ; VandenBygaart, A. J. (2018). “Comments on soil carbon 4 per mille by Minasny et al. 2017”. Geoderma, 309, 113–114. https://doi.org/10.1016/j.geoderma.2017.05.024 ; de Vries, W. (2018). “Soil carbon 4 per mille: A good initiative but let’s manage not only the soil but also the expectations”. Geoderma, 309, 111–112. https://doi.org/10.1016/j.geoderma.2017.05.023	Noted. This passage will be changed as part wider planned changes to the entire section. The reviewers specific point is noted.	David Powlson	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
37453	50	52	51	2	What level of global emissions is assumed in this statement on offsetting? Given that emissions need to reapidly decline and ultimately go net negative, is this an appropriate way to describe the size of the potenital carbon storage in soils?	Noted. This passage will be changed as part of extensive revision of the section.	Michiel Schaeffer	Climate Analytics	Netherlands
27635	50	47	77	49	Both soil carbon saturation (p50) and forest carbon saturation (p77) after 50 years are small problems compared tot the absolute need to stop global warming within this period; They're not totally relevant because in 50 we will probably have moved away from fossil fuels and might have other carbon capture techniques ready. Also, when the forest trees stop growing, forest still captures carbon in enriching soil and in dead logs and branches. Soil carbon saturation might be solvable too.	Noted. The reviewers interesting point will be considered, thank you. This entire section will be revised.	Dorota Retelska	Independent	Switzerland
26327	50	8			mitigation and adaptation	Noted. This sentence will be changed.	LUIS ESCUDERO	INIAP	Ecuador
29565	50	9			Crist et al. 2017; Add this article to the reference	Accepted. All references and associated listing will be checked.	RAEHYUN KIM	Institute	Republic of Korea
29719	50	9			Meyfroidt, 2018; Add this article to the reference	Noted. Thank you.	RAEHYUN KIM	Institute	Republic of Korea
29639	50	10			Harvey and Pilgrim 2011; Add this article to the reference	Accepted. All reference will be checked.	RAEHYUN KIM	Institute	Republic of Korea
29657	50	10			Humpenoder et al. 2014; Add this article to the reference	Noted.	RAEHYUN KIM	Institute	Republic of Korea
29723	50	10			Mouratiadou et al 2016; Add this article to the reference	Noted, thank you.	RAEHYUN KIM	Institute	Republic of Korea
29729	50	11			Nemet et al. 2018; Add this article to the reference	Accepted. All references will be checked.	RAEHYUN KIM	Institute	Republic of Korea
29739	50	11			Pereira et al. 2010; Add this article to the reference	Noted.	RAEHYUN KIM	Institute	Republic of Korea
29775	50	11			Sanchez et al. 2017; Add this article to the reference	Noted. All reference will be checked.	RAEHYUN KIM	Institute	Republic of Korea
21819	50	12		13	severla reseacr can be adopt to improve this statement	Noted. This sentence will be revised.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
22707	50	12		13	But you are discussing soil, not living plant sequestration here. I think you should omit this sentence “In fact….”	Accepted. This sentence will be changed.	Melissa Lucash	Portland State University	United States of America
20177	50	13		15	See Zomer et al (2016) for some numbers. Global tree cover and biomass carbon on agricultural land: The contribution of agroforestry to global and national carbon budgets. Nature Scientific Reports, 6:29987 | DOI: 10.1038/srep29987	Noted. The authors thank the reviewer for the suggested reference.	Henry Neufeldt	UNEP DTU Partnership	Denmark
22709	50	29		36	This sounds more like total (above- and belowground) C sequestration, not just soil. If soil, please make that clearer.	Noted. The sentence will be changed as part of wider, planned revision of the section.	Melissa Lucash	Portland State University	United States of America
22711	50	41			Tell us why we should be cautious. This is an important point	Accepted. This sentence will be revised.	Melissa Lucash	Portland State University	United States of America
46881	50	43			It could be helpful to give good practice examples here since those incentive systems are in place in many countries already (e.g. EU agri-environmental programs, carbon trading systems in US and AUS, etc.	Noted. The sentence / paragraph will be revised.	Martin Schönhart	University of Natural Resources and Life Sciences, Vienna	Austria
29903	50	47			Wiesmier et al. 2019; Add this article to the reference	Noted. All references will be checked.	RAEHYUN KIM	Institute	Republic of Korea
39793	50	47			inorganic C saturates at a much higher level, effectively when calcium carbonate fills all the soil pore space through the formation of a calcrete.	Noted and thank you. This will be taken into account during revisions.	David Manning	Newcastle University	United Kingdom (of Great Britain and Northern Ireland)
30607	51	1	51	2	For how long would this "20-35% offset of global GHG emissions" last, given the time-limited nature of soil C sequestratation? Additionally, does this estimate factor in potential reversibility of sequestration?	Noted. The sentence will be revised as part of wider planned changed to the section. The reviewer's point is an important one.	Raychel Santo	Johns Hopkins Center for a Livable Future, Bloomberg School of Public Health	United States of America
32959	51	1	51	2	More detail required. 20-35% of total GHG emissions on what time horizon? Annual GHG emissions?	Accepted. This is an important point. This statement will be revised.	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
38849	51	1	51	2	If the concept of soil C saturation causes potential C sequestration to plateau or level off, then what is the time frame for offsetting this 20-35% global GHG emissions? In other words, from when to when are we offsetting 20-35% of global GHG emissions? If not indefinitely as the first sentence in the paragraph reads, then when, and at what time scale or period of time?	Accepted. This is an important point and will be taken into consideration during planned revisions.	Julian Reyes	Personal Capacity	United States of America

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
32961	51	4	51	6	This is a very central point and I am surprised that it is still only mentioned in the sidelines here. Calculating all these potentials for individual options at a global scale is - in my opinion - very misleading. Instead of presenting these numbers with (necessarily) huge ranges, wouldn't it be more useful to put much more emphasis on the location dependency of C sequestration and calling for more integrated (optimization) approaches to calculate realistic instead of technical potentials?`	Accepted. The section is planned to be extensively revised, with the aim of highlighting regional mitigation potential, and associated variation.	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
9829	51	7	51	7	Figure 2 is missing.	Noted. This will be revised.	Jeanne Bormann	Ministry of agriculture	Luxembourg
10585	51	7	51	8	"Figure 2 presents a summary for drivers and indicator of soil carbon sequestration". I didn't find a Figure 2.	Noted. This will be checked and revised.	Wen Zhang	Institute of Atmospheric Physics, Chinese Academy of Sciences	China
6271	51	7	51	12	Page 7-51line 7 Figure 2 is missing (I think the Figure and Tables captured with the chapter e.g. Figure 7.2). Page 7-51 line 11 and 12 Table 7.8 is not fully described to depict the message to readers – what the numbers do mean. Need to have some explanation.	Accepted. All figures and tables, and associated explanations and description will be revised.	Brown Gwambene	Marian University College	United Republic of Tanzania
22465	51	8	51	8	Change "summary for" to "summary of"	Accepted. This will be changed.	Donald Smith	McGill University	Canada
22467	51	8	51	8	Change "indicator" to "indicators"	Accepted. This sentence will be revised.	Donald Smith	McGill University	Canada
22469	51	8	51	8	Change "sequestration and" to "sequestration of"	Accepted. This will be changed.	Donald Smith	McGill University	Canada
29013	51	8	51	8	where is "Figure 2"?	Noted. Figure 2. is currently missing and will be revised.	Marissa Malahayati	National Institute for Environmental Studies	Japan
32963	51	8	51	9	The variation in soil carbon storage potentials is possibly also explained by the variation in particular options considered in the studies and the assumptions underlying the calculations.	Noted & agreed. The entire section is to be revised. The reviewer's point will be taken into consideration.	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
32965	51	11	51	12	The table requres more detail on the SOC sequestration options considered in the different studies and main assumptions taken.	Acceptd. This table is likely to be removed during substantial revision, however, the reviewer's point will be taken into account during revisions.	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
6729	51	11	51	13	I don’t understand the use of presenting a table with such widely differing values for C sequestration without some explanation. Line 7 above indicates a 'Figure 2' that explains the variation but this figure appears to be missing. In this whole section there is no mention of soil texture which is known to be a major determinant of the C sequestration potential of soils	Accepted. This table will likely be removed as part of planned revision of the entire section, while the missing 'Figure 2' will be addressed. The authors note the reviewer's point regarding soil texture, which will be taken into account.	Ken Giller	Wageningen University	Netherlands
27181	51	12	51	12	Table 7.8 : The number of 9 supposedly given by Minasny et al (2017) is wrong. These authors suggest 2-3 PgCyr-1. It should be also noted that the authors recognize themselves that this estimate is optimistic (rejoinder comments to Minbsamy et al 2017, Geoderma, 309, 124-129.	Noted. This table will be changed as part of substantive revisions. However, the authors note the reviewer's point concerning Minasny et al.	Marc Aubinet	University of Liege	Belgium
27183	51	12	51	12	Table 7.8 : Why are numbers by Niles et al; Jia et al. Roe et al (cited in the text) not given in the figure?	Noted. The text and table will be extensively revised.	Marc Aubinet	University of Liege	Belgium
27185	51	12	51	12	Table 7.8 : Rather than averages, number ranges should be given : ex: Smith 0.1-2.3 rather than 1.6: Lal : 1.45-3.44 rather than 2.45	Accepted. This table, and indeed text, will be extensively revised with plans of providing ranges.	Marc Aubinet	University of Liege	Belgium
27187	51	12	51	12	Table 7.8: the different numbers presented in the table do not represent the same things : for example, Zomer et al consider only crop soils while Minasny consider all agricultural soils and Lal all world soils.	Noted. This table will be extensively revised as part of panned wider changes to the section.	Marc Aubinet	University of Liege	Belgium
27189	51	12	51	12	Table 7.8: I don't know where the number by Griscom comes from. By looking to the paper of Griscom (supplementary material, page 10) I found a mitigation potential for agriculture and grasslands of 4.4-6.9 GtCO2e yr-1, i.e., 1.2-1.9 GtCe yr-1	Noted. The figures outlined in the table are to be revised.	Marc Aubinet	University of Liege	Belgium
27235	51	12	51	12	The Table should also cite less optimistic estimates: Batjes (Land Degradation and Develop, 30, 25-32) suggest 0.05–0.12 Pg C yr−1 to 0.14–0.37 Pg C yr−1, with a technological potential of 0.32–0.86 Pg C yr−1 or 0.07–0.12 Pg C yr−1, 0.21–0.35 Pg C yr−1, and 0.60–1.01 Pg C yr−1 according to the method he uses.	Accepted. The mentioned table is to be revised, along with supporting text which will outline the full range (including the less optimistic) of estimates.	Marc Aubinet	University of Liege	Belgium
30609	51	12	51	13	What is the time frame for these estimated soil C storage potentials? Do these represent mean potential over a certain of number of years or only a snapshot in time?	Noted. The table is to be thoroughly revised. Consideration will be given to timeframes.	Raychel Santo	Johns Hopkins Center for a Livable Future, Bloomberg School of Public Health	United States of America
30611	51	12	51	13	How do these estimated soil C storage potentials differ based on the level of "baseline" soil degredation?	Noted. The table and associated text will be extensively revised. However, estimate are assumed to consider baseline soil condition / quality. This will be checked.	Raychel Santo	Johns Hopkins Center for a Livable Future, Bloomberg School of Public Health	United States of America

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
27177	51	17	51	21	This paragraphs is not at its place as it does not refer only to conservation agriculture but is more general.	Accepted. The paragraph will be revised as part of wider, planned changes to the section.	Marc Aubinet	University of Liege	Belgium
32969	51	17	51	21	Paragraph doesn't fit under heading 'Conservation Agriculture'.	Accepted. This paragraph and section will be extensively revised.	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
32971	51	23	51	24	Include reference: Kassam A, Friedrich T, Derpsch R (2019) Global spread of Conservation Agriculture. International Journal of Environmental Studies, 76, 29–51.	Noted. This passage will be rewritten and use of references will be checked.	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
28791	51	23	51	29	Defination of "Conservation Agriculture" is aproximatley complete, but please mention organic fertilizre, intercropping, rotation and integrated pest management.	Noted. This will be revised as part of wider planned changes to the section.	Alireza Yazdani	Shiraz University	Iran
12269	51	23	51	43	A brief on limitations for conservation agriculture, no tillage and others, if any, should also be included. For SOC storage, soil depth considered for the estimation should be included (see Table 7.9 in the next page).	Noted. This section will be extensively revised and these points will be considered.	Mohammad Ibrahim Khalil	University College Dublin	Ireland
22475	51	24	51	24	Change "an" to "in"	Noted. The sentence will be changed.	Donald Smith	McGill University	Canada
22471	51	24	51	34	Change "in" to "on"	Noted, thank you. The sentence will be revised.	Donald Smith	McGill University	Canada
28313	51	25	51	27	Move the reference Kassam et al. 2019 initially line 27, to the end of the sentence finishing by all ecologies line 25	Noted. The sentence will be revised.	catherine Hénault	INRAE	France
46885	51	31	51	35	"Conservation agriculture" seems unclearly defined. In it's most narrow sense, it is altered soil management (see p51, l23). I stated this way, there is a need to address the trade-offs, e.g. higher pesticide use required in many cases, where farmers give up plowing.	Noted. The definition of CA will be revised as part of wider changes to the entire section.	Martin Schönhart	University of Natural Resources and Life Sciences, Vienna	Austria
28317	51	31	51	47	I suggest to only use independant and peer-reviewed references in this paragraph (and all the report !). For example, I really wonder if the reference Montgomery, 2017 was peer-reviewed. Thus the text before the reference potentially need to be adapted.	Noted. The reference will be revised as part of wider changes planned for the section.	catherine Hénault	INRAE	France
28315	51	32	51	32	change ; after (Pittelkow et al., 2015) by ,	Noted. Punctuation will be revised.	catherine Hénault	INRAE	France
39267	51	32	51	32	Consider the reference: Stoécio M.F.MaiaaStephen M.OglebCarlos C.CerricCarlos E.P.Cerri. Changes in soil organic carbon storage under different agricultural management systems in the Southwest Amazon Region of Brazil. Soil and Tillage Research. Volume 106, Issue 2, January 2010, Pages 177-184.	Noted. The authors thank the reviewer for the suggested reference.	Roberta Zecchini Cantinho	UNDP / UnB	Brazil
763	51	32	51	33	I would also refer to this systematic literature review, showing that increased SOC stocks can also be achived in sub-Saharan African farming systems using conservation agriculture, and at an higher rate than the aspirational goal of the 4 per 1000 initiative: Corbeels, M., Cardinael, R., Naudin, K., Guibert, H., Torquebiau, E., 2019. The 4 per 1000 goal and soil carbon storage under agroforestry and conservation agriculture systems in sub-Saharan Africa. Soil Tillage Res. 188, 16–26. doi:10.1016/j.still.2018.02.015	Noted. The authors thank the reviewer for the suggested text and reference. This will be considered.	Rémi CARDINAEL	CIRAD	France
2915	51	34	51	34	In addition to no-till, low-till (combination of till and no-till) can be considered as one of conservation agriculture techniques. For example, low-till may allow limited amount of shallow disc harrowing but no plowing.	Noted. 'Low till' or 'min-till' will be considered during revisions.	Yurii Pyrozhenko	IPCC TFI TSU	Japan
10587	51	35	51	35	"estimated at 600 to 1,000 lb SOC/ac-year". 'lb SOC/ac-year' needs an explanation.	Noted. The use of the value and associated discussion will be revised.	Wen Zhang	Institute of Atmospheric Physics, Chinese Academy of Sciences	China
22179	51	35	51	35	Consistency in unit use, e.g. lb SOB/a-y	Noted. Unit values will be revised.	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
22473	51	35	51	35	Change "600 to 1,000 lb SOC/ac-year" to metric	Noted. The value units will be revised.	Donald Smith	McGill University	Canada
27179	51	35	51	35	Use SI Units.	Noted. Value units will be revised.	Marc Aubinet	University of Liege	Belgium
30613	51	35	51	35	Again, does this C sequestration potential take into account the time-limited nature of C sequestration, or potential reversibility?	Noted. This will be reviewed.	Raychel Santo	Johns Hopkins Center for a Livable Future, Bloomberg School of Public Health	United States of America

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
32973	51	35	51	35	Worth to mention that CA systems usually rely on heavy application of herbicides which may have detrimental environmental effects!?	Noted. Discussion on potential reliance on herbicides will be considered.	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
27623	51	35	51	36	Reference missing in chapter 7 bibliography: Lal, and I didn't check for all the missing references	Noted and thank you. All references will be checked.	Dorota Retelska	Independent	Switzerland
10589	51	37	51	39	"The impact of no till farming …, but can be neutral or even negative, depending on the amount of crop residues returned to the soil...". I recommend revise the sentence as "The impact of no till farming ..., but but can be neutral or even negative, depending on various factors, e.g., the amount of crop residues returned to the soil..."	Noted and thank you. This will be considered for inclusion.	Wen Zhang	Institute of Atmospheric Physics, Chinese Academy of Sciences	China
6731	51	38	51	38	Emphasis is given to the paper of Gonzalez-Sanchez et al. 2012 - suggesting that conservation agriculture often leads to C sequestration. I would argue that the scientific consensus is that there is no clear benefit of conserbattion agriculture on C stocks in soil - see Govaerts, B., Verhulst, N., Castellanos-Navarrete, A., Sayre, K. D., Dixon, J. & Dendooven, L. (2009). Conservation agriculture and soil carbon sequestration: Between myth and farmer reality. Critical Reviews in Plant Sciences 28: 97–122. and Giller, K. E., Andersson, J. A., Corbeels, M., Kirkegaard, J., Mortensen, D., Erenstein, O. & Vanlauwe, B. (2015). Beyond Conservation Agriculture. Frontiers in Plant Science 6: Article 870. for example. The reasons for this are that soil compaction is often not properly taken into account - see Wendt, J. W. & Hauser, S. (2013). An equivalent soil mass procedure for monitoring soil organic carbon in multiple soil layers. European Journal of Soil Science 64: 58-65.	Noted. The authors thank the reviewer for the suggested amendment and associated references. Major changes to the section are planned and this will be kept in mind when making revisions.	Ken Giller	Wageningen University	Netherlands
26911	51	38	51	43	It also appears to be a funciton of N availability (Sisti 2004, Soil B. Bch.; Denf 2007, Soil Till. Res.). I imagine there are newer studies that have covered this.	Noted. This will be considered during revision of the section.	Louis Verchot	International Center for Tropical Agriculture	Colombia
2931	51	39	51	39	In addition to N from crop residues, nitrous oxide emissions from no-tillage can increase due to decrease in soil pH (https://doi.org/10.1038/s41598-019-56694-3).	Noted. This will be considered when making revisions to the section.	Yurii Pyrozhenko	IPCC TFI TSU	Japan
9831	51	42	51	43	Explain the abbreviation "CT system" (conventional?).	Accepted. Appropriate definition of all abbreviations will be reviewed.	Jeanne Bormann	Ministry of agriculture	Luxembourg
28319	51	43	51	43	I suggest to add recent references presenting some meta-anlysis dealing with impacts of conservation agriculture Cseq / GHG emissions. For example, Mei et al., 2018 observed that conservation tillage overall significantly increased soil N2O emission, especially in tropical conditions. Conservation tillage induced N2O emission depends on numerous parameters and thus local management of conservative agriculture is required.	Noted. The authors thank the reviewer for the suggested references.	catherine Hénault	INRAE	France
32975	51	43	51	43	Are there more up-to-date studies on N2O effects in CA systems?	Noted. More up to date references have been suggested by other reviewers.	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
32967	51	15	52	4	The focus is too much on SOC sequestration in conservation agriculture systems, where evidence on the real potential and quantification is missing widely (see, e.g., Powlson et al. (2014), VandenBygaart (2016), Conant et al. (2007)). Biophysical effects (which are possibly much more important for local climate, see e.g., Davin et al., Hirsch et al. 2018) are missing. Powlson DS, Stirling CM, Jat ML, Gerard BG, Palm CA, Sanchez PA, Cassman KG (2014) Limited potential of no-till agriculture for climate change mitigation. Nature Climate Change, 4, 678–683.; VandenBygaart AJ (2016) The myth that no-till can mitigate global climate change. Agriculture, Ecosystems & Environment, 216, 98–99.; Conant RT, Easter M, Paustian K, Swan A, Williams S (2007) Impacts of periodic tillage on soil C stocks: A synthesis. Soil and Tillage Research, 95, 1–10.; Davin EL, Seneviratne SI, Ciais P, Olioso A, Wang T (2014) Preferential cooling of hot extremes from cropland albedo management. Proceedings of the National Academy of Sciences of the United States of America, 111, 9757–61.; Hirsch AL, Prestele R, Davin EL, Seneviratne SI, Thiery W, Verburg PH (2018) Modelled biophysical impacts of conservation agriculture on local climates. Global Change Biology, 24, 4758–4774.	Noted. The authors thank the reviewer for the suggested references. The section will be extensively revised and the reviewers point concerning wider impacts of CA, will be kept in mind.	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
25777	51	15	52	13	This section is somewhat misleading. In the intro paragraph, several different approaches to sustainable agriculture are named, but, according to the title, this section covers only conservation agriculture. In the following paragraphs, papers investigating the impact of specific practices on soil carbon are cited (e.g. Haddaway et al. (2017) assessment of tillage). These papers do not necessarily focus on, or even mention, CA as an approach. The findings of these papers are therefore relevant for a broader set of sustainable approaches to agriculture, such as those mentioned in the opening paragraph, and also for independent changes in the practices examined. I am not clear on the reason for discussing only CA out of the range of sustainable approaches. I think this section should either be discussing 'sustainable management practices' and have a paragraph on each practice, or, if the focus on CA is maintained, then should take care to reference papers that look at the impacts of CA as a whole, rather than citing more widely applicable papers within a narrow focus.	Accepted. This subsection will be revised as part of changes to the entire section. It is agreed that in its current state, coverage of specific topics may be somewhat disjointed.	Helen Hughes	University of Edinburgh	United Kingdom (of Great Britain and Northern Ireland)
28793	51	31	52	41	Ther is no need to such so explanaing for conservation agriculture. In each case, also a short description is enough.	Noted. This paragraph will be revised.	Alireza Yazdani	Shiraz University	Iran

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
10591	51	45	52	5	There is a study showing that the win-win achievement of both enhanced C sequestration and increased crop yield via CA practice is possible in arid regions, More humid regions are more likely to increase SOC only by CA practice, while some colder regions have yield losses and soil C loss as likely as soil C gains (Sun et al., 2020, Global Change Biology, https ://doi.org/10.1111/gcb.15001)	Noted. The authors thank the reviewer for the suggested material and reference.	Wen Zhang	Institute of Atmospheric Physics, Chinese Academy of Sciences	China
32977	51	45	52	5	Also Prestele R, Verburg PH (2020) The overlooked spatial dimension of climate-smart agriculture. Global Change Biology, 26, 1045–1054.	Noted. The authors thank the reviewer for the suggested reference.	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
37085	51	45	52	5	Clarification needed here that the precision management of nitrogen fertilizer can decrease these impacts. Application rate, timing, and location can all help to reduce the emissions of N2O from fertilizer breakdown.	Noted. The authors thank the reviewer for this suggested inclusion.	Jeffrey Seale	Bayer Crop Science	United States of America
22181	51	15	53	4	It would be stronger if examples on SOC increases due to CA implementation are also added although cautions must also be practiced to due high risk of erosion and fast SOC decomposition	Noted. The inclusion of examples of SOC increases from C.A. will be considered. However, SOC will specifically be covered in a revised 'soils' subsection.	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
46537	51	25	53	4	The discussion about Conservation Agriculture (CA) needs more measured assessment, some statements are too simplistic. For example, this sentence "There is worldwide scientific evidence from research and empirical evidence from farmer practice to show that CA is an effective strategy for climate change adaptability and mitigation (Kassam et al., 2019; Lal, 2015)." does not have any qualifiers, and contradicts the following paragraph, which indicates more debate and conflicting evidence about the effectiveness of CA as a climate change adaptation and mitigation strategy. See for example: Corbeels M, Emmanuel Torquebiau, Hervé Guibert, Krishna Naudin, Rémi Cardinael. The 4 per 1000 goal and soil carbon storage under agroforestry and conservation agriculture systems in sub-Saharan Africa. Soil & tillage research. 2019;188:16-26; Sommer R, Paul BK, Mukalama J, Kihara J. Reducing losses but failing to sequester carbon in soils – the case of Conservation Agriculture and Integrated Soil Fertility Management in the humid tropical agro-ecosystem of Western Kenya. Agriculture, Ecosystems & Environment. 2018;254:82-91. doi:10.1016/j.agee.2017.11.004.	Noted. This subsection will be extensively revised, with the aim of presenting more balanced and nuanced discussion. The authors thank the reviewer for the suggested references.	Rachel Bezner Kerr	Cornell University	United States of America
21821	51	1			The authors ?pls mention the name	Accepted. This sentence will be changed.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
3467	51	7			Figure 7.2 instead of figure 2	Noted. The numbering of figures and associated referencing will be checked.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
14807	51	7			Figure 2, It should be some other figure number	Noted, thank you.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
21823	51	11			Table 7.8 need more improvement both data and location of research	Noted. This table will be revised as part of wider revisions to the subsection.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
43309	51	11			this table shows a huge range--must provide more text to describe why the numbers are so different--more columns with e.g. area covered, region, practice? Needs context	Accepted. This table will be revised as part of wider changes to the entire section.	Deborah Lawrence	University of Virginia	United States of America
14809	51	12			If possible the range of soil C storage potential with Stdev/uncertainty shuold be given in table 7.8	Noted. This table will be revised as past of broader changes to the entire section.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
22713	51	12			You say storage, but it's really sequestration in the table column header.	Noted. This table will be revised as part of broader changes to the entire section.	Melissa Lucash	Portland State University	United States of America
10467	51	15			The chapter needs to define terms such as conservation agriculture (check glossary first), as often different people mean very different things. The current text doesn't seem right - e.g. "improved rice management" is not necessarily part of conservation agriculture, as it depends entirely on how this "improved" management is achieved. Also make clear that the umbrella term "conservation agriculture" largely simply encompasses a range of specific activities that have already been mentioned in preceding sections. Generally, this section also is largely a text book and/or literature review, but not an assessment - what is the reader to make of those diverse studies with divergent findings? What's the potential scale of conservation agriculture within global and regional food demand?	Noted. This subsection will be completely revised as part of planned, wider changes to the entire section.	Andy Reisinger	NZAGRC	New Zealand
26329	51	19			,foods security crops	Noted. The subsection will be extensively revised. It is hoped that changes will satisfy the reviewer's comment.	LUIS ESCUDERO	INIAP	Ecuador
17803	51	20		20	GTCO2eq not GtCO2e.	Noted. All metrics will be checked.	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
14811	51	24			Reference should be quoted for the area under conservation agriculture in all the continents (180 million ha). The practice of conservation agriculture in rice wheat system may not be that effective specially in case wheat followed by puddled transplanted rice with flooding which might enhance the loss of stored carbon in tropical regions	Noted. This subsection will be extensively revised. Discussion on areas currently under CA, and the impact of CA in rice systems will be considered during revisions.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
26331	51	34			minimum tillage	Noted. Minimum tillage will be included.	LUIS ESCUDERO	INIAP	Ecuador
17805	51	35		35	Better convert into IS units not lb and ac, to be consistent in the chapter with the figures given.	Accepted. All metric units will be checked.	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
3469	51	35			600 to 1,000 lb SOC/ac-year	Noted. All metric units will be reviewed.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
29695	51	35			Lal, 2016; Add this article to the reference	Noted. All references will be checked.	RAEHYUN KIM	Institute	Republic of Korea
3471	51	42			what is CT?	Noted. Appropriate definition of abbreviations will be included.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
6865	51	49			I would suggest starting the sentence differently. So "But assuming... " change to "Assuming ..."	Noted. The sentence will be changed	Valasia Iakovoglou	International Hellenic University	Greece
6899	51				The introducory paragraph needs further improvement in order to have a smooth transition and flow. Please consider including at least three (3) sentences at eacp paragraph.	Noted. It is planned to revise the entire subsection.	Valasia Iakovoglou	International Hellenic University	Greece
27193	52	7	52	13	A more detailed description of cover crop impacts (quantification of observed C sequestration; mitigation potential; possible adverse effects) would be desirable. A specific section devoted to this action should be proposed in 7.5.3.	Noted. Cover crop impacts will be covered within a revised 'soils' section, while the section mentioned will be extensively revised.	Marc Aubinet	University of Liege	Belgium
27191	52	10	52	11	I don't see the relevance of the sentence "Accumulated soil...". It seems out of scope (and debatable). In addition the refrence to Basche et al is not relevant as this paper treats of N2O emissions and not of CO2 emissions	Noted. This sentence will be revised.	Marc Aubinet	University of Liege	Belgium
32979	52	14	52	16	Why only 'degraded semi-arid environments'? CA can be (and is) applied beyond these conditions, hence it doesn't make sense to limit its scope here.	Noted. This statement will be schengen as part of wider changes the section. The reviewers point is noted.	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
27195	52	14	52	22	This paragraph lacks references.	Noted. The paragraph will be revised and will include references.	Marc Aubinet	University of Liege	Belgium
32981	52	16	52	22	Socioeconomic, institutional, and political barriers are probably the more important factors (compared to the yield and SOC considerations) for the up-to-date limited spread of conservation agriculture across world regions (see e.g. Kassam et al. 2019; Giller et al. 2009; Brown et al. 2018a,b, 2017). It would be therefore very useful to put more attention to these factors and also summarize the current knowledge here and what are strategies and approaches to overcome these issues. Kassam, A., Friedrich, T., Derpsch, R., 2019. Global spread of Conservation Agriculture. Int. J. Environ. Stud. 76, 29–51. https://doi.org/10.1080/00207233.2018.1494927; Giller, K.E., Witter, E., Corbeels, M., Tittonell, P., 2009. Conservation agriculture and smallholder farming in Africa: The heretics' view. F. Crop. Res. 114, 23–34. https://doi.org/10.1016/j.fcr.2009.06.017; Brown, B., Nuberg, I., Llewellyn, R., 2018. Constraints to the utilisation of conservation agriculture in Africa as perceived by agricultural extension service providers. Land use policy 73, 331–340. https://doi.org/10.1016/J.LANDUSEPOL.2018.02.009; Brown, B., Nuberg, I., Llewellyn, R., 2018. Pathways to intensify the utilization of conservation agriculture by African smallholder farmers. Renew. Agric. Food Syst. 1–13. https://doi.org/10.1017/S1742170518000108;Brown, B., Nuberg, I., Llewellyn, R., 2017. Stepwise frameworks for understanding the utilisation of conservation agriculture in Africa. Agric. Syst. 153, 11–22. https://doi.org/10.1016/j.agsy.2017.01.012.	Noted. The authors thank the reviewer for their point and associated references. Consideration will be given to discussion on barriers during the revision of the section.	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
22477	52	21	52	21	Change "business" to "the business"	Accepted. This sentence will be changed.	Donald Smith	McGill University	Canada
9907	52	24	52	28	This table is misleading. No-till farming has been shown to have no impact on soil C when the entire soil profile (down to 1 metre depth) is accounted for (Haddaway et al., 2017).	Noted. This will be taken into account when revising the section. The authors thank the reviewer for the suggested reference.	Valentin Bellassen	INRAE	France
2945	52	26	52	26	Zero Tillage and Minimum Tillage are also most of the conservative, climate smart and environmental friendly practices to build resistance against changing climate "Table 7. 9 Soil organic matter accumulation in soils as affected by conservation agriculture practices over 25 European eco -regions (Gonzalez -Sanchez et al., 2017).	Noted. However, it is unclear what the reviewer suggests.	Adnan Arshad	China Agricultural University	China
8569	52	26	52	26	The unit in Table 7.9 has to be modified to t C ha-1 yr-1.	Noted. The table will be modified.	Eun Jung Choi	National institute of agricultural sciences	Republic of Korea

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
27197	52	26	52	26	Table 7.9 : as C sequestration diminishes with time due to sink saturation, the rates shown in this table are not constant (expected to decay to zero in 5O years). It should thus necessary to specify on which period these rates have been averaged. They also probably depend on the inital conditions.	Noted. The table will be revised and modified.	Marc Aubinet	University of Liege	Belgium
30615	52	26	52	27	Again, does this C sequestration potential take into account differing "baselines" of soil degredation, the time-limited nature of C sequestration, or potential reversibility?	Noted. The table will be revised and modified as appropriate.	Raychel Santo	Johns Hopkins Center for a Livable Future, Bloomberg School of Public Health	United States of America
6733	52	28	52	34	This section is based largely on theb paper of Gonzalez-Sanchez et al. 2019 - which is a highly problematic study. Corbeels et al (2020)). Carbon sequestration potential through conservation agriculture in Africa has been largely overestimated. Comment on: “Meta-analysis on carbon sequestration through conservation agriculture in Africa”. Soil and Tillage Research 196, 104300. https://doi.org/10.1016/j.still.2019.104300 - show that this study is highly flawed - as well as that the adoption rates stated by Kassam et al 2018 are grossly overestimated. I suggest that all reference to this paper is removed from the report	Noted. The authors thank the reviewer for their point and suggested reference. The passage will be revised.	Ken Giller	Wageningen University	Netherlands
765	52	29	52	34	The results from Gonzalez-Sanchez et al. (2019) are flawed and biased. A comment paper was written to show why and how in 5 different points. I therefore recommend to remove this paragraph referring to a paper full of errors (and definitelty not a meta-analysis). If this paragraph is finally kept by the Lead Authors of this Chapter 7, it must be counterbalanced by the arguments mentionned in Corbeels et al 2020. Corbeels, M., Cardinael, R., Powlson, D., Chikowo, R., Gerard, B., 2020. Carbon sequestration potential through conservation agriculture in Africa has been largely overestimated: Comment on: “Meta-analysis on carbon sequestration through conservation agriculture in Africa.” Soil Tillage Res. 196, 104300. doi:10.1016/j.still.2019.104300	Noted. The paragraph and the inclusion of the mentioned reference will be reviewed and revised accordingly. The authors thank the reviewer for the suggested references.	Rémi CARDINAEL	CIRAD	France
1015	52	29	52	34	Gonzalez-Sanchez et al. (2017) is cited as evidence for extremely high rates of soil C sequestration in Africa. A later paper showed that the values derived in this paper to be totally flawed for a range of reasons. Despite the title of the paper claiming to be a meta-analysis of data, it was shown that the authors did not conduct a meta-analysis but made inappropriate extrapolations from specific sites. Therefore this section and Table 7.10 should be deleted. Details are in Corbeels et al (2020)). Carbon sequestration potential through conservation agriculture in Africa has been largely overestimated. Comment on: “Meta analysis on carbon sequestration through conservation agriculture in Africa”. Soil and Tillage Research 196, 104300. https://doi.org/10.1016/j.still.2019.104300	Noted. The paragraph and use of the specific reference mentioned will be reviewed and revised accordingly.	David Powlson	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
27201	52	30	52	32	These results (as well as those presented in Table 7.10) have been criticized by Corbeels et al (Soil and Tillage research, 196, 104300, 2020) who found them greatly overestimated (by a factor 10 !)	Noted. Conclusions drawn by Corbeels *et al.* will be examined and the text adjusted accordingly.	Marc Aubinet	University of Liege	Belgium
27199	52	32	52	32	The sentence "this figure…" (copied from the original paper) is not clear at all. In the paper, we can find " in Africa there exists an enormous C sink potentialwhich is around 93 times greater than under the current situation" which is slightly better. However, I'm still wondering what is the "current situation".	Accepted. This sentence will be changed as part of extensive revisions planned for the section.	Marc Aubinet	University of Liege	Belgium
27203	52	33	52	34	The reference of Gonzales-Sanchez (2017) is not from a peer reviewed journal. Besides, the same first author published a paper on the same topic in a peer revied journal (AIMS Agriculture and Food, 1(4), 387-408, 2006) but with a much lower number : 101.45 MtCO2 yr-1 rather than 189 Tg CO2 yr-1.	Noted. The authors thank the reviewer for the suggested reference. The passage will be reviewed.	Marc Aubinet	University of Liege	Belgium
14815	52	36	52	37	Reference should be given.	Accepted. The passage will be reviewed and references will be added as required.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
1017	52	36	52	41	Data on rates of soil C sequestration attained through conservation agriculture (CA) in Sub-Saharan Africa and the Indo-Gangetic Plains are quoted from Powlson et al (2016) “Does conservation agriculture deliver climate change mitigation through soil carbon sequestration in tropical agro-ecosystems?” Agriculture Ecosystems & Environment 220, 164-174. https://doi.org/10.1016/j.agee.2016.01.005 Some additional caveats should be included. Powlson et al (2016) concluded that the largest rates were obtained when crop diversification was included as part of CA but the authors noted that, in practice, this element is often missing. Many practical applications referred to as CA only comprise zero tillage and crop residue retention.	Noted. The authors thank the reviewer for pointing this out. The passage will be reviewed and revised accordingly.	David Powlson	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
28321	52	39	52	41	I suggest to change the sentence as follows : Conservation agriculture can could serve to mitigate ….. and reducing fuel consumption, with the condition that it would not increase N2O emission	Noted. The sentence will be changed.	catherine Hénault	INRAE	France
17807	52	24	53	4	t and Mg are the same, decide which one use. Despite t is commonly used everywhere, Mg should be better. Anyway, it is better to harmonise. In addition Ha should be ha in table 7.10	Noted. The use of metrics will be reviewed and adjusted accordingly.	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
19809	52	29	53	4	The methods and results of Gonzalez-Sanchez are challenged (Methods, Results) in Marc Corbeels, et al., Soil & Tillage Research, https://doi.org/10.1016/j.still.2019.104300.	Noted. This paragraph and the conclusions outlined will be reviewed.	Michael Englisch	Austrian Research Centre for Forests	Austria
21825	52	1		2	better if this statement more explanation to make it clear (emissions could be increased through indirect land use change, 2 and there could also be adverse side-effects on food security) how???	Noted. This sentence will be reviewed and revised accordingly.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
29559	52	2			Cheesman et al. 2016; Add this article to the reference	Noted. All references will be checked.	RAEHYUN KIM	Institute	Republic of Korea
29569	52	3			de Moraes Sá et al. 2017; Add this article to the reference	Noted. Thank you.	RAEHYUN KIM	Institute	Republic of Korea
29615	52	3			Gao et al. 2018; Add this article to the reference	Noted.	RAEHYUN KIM	Institute	Republic of Korea
29673	52	3			Keesstra et al. 2016; Add this article to the reference	Noted. The reference list will be updated.	RAEHYUN KIM	Institute	Republic of Korea
29699	52	3			Lambin and Meyfrodit 2011; Add this article to the reference	Accepted. The reference list will be updated.	RAEHYUN KIM	Institute	Republic of Korea
29645	52	4			Hijbeek et al., 2017; Add this article to the reference	Accepted. The reference list will be checked.	RAEHYUN KIM	Institute	Republic of Korea
29791	52	4			Soussana et al. 2019; Add this article to the reference	Noted. All references will be checked.	RAEHYUN KIM	Institute	Republic of Korea

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
5923	52	5		28	There is little evidence to support statements made (on energy inputs and GHGs) and the references are dated. This section needs updating and expanding to becoem a true assessment	Noted. It is unclear precisely which sentence / section the reviewer is referring to. However, the entire subsection will be revised as part of wider planned changes.	Ralph Sims	Massey University	New Zealand
29781	52	5			Schjønning et al., 2018; Add this article to the reference	Noted. The reference list will be checked.	RAEHYUN KIM	Institute	Republic of Korea
21827	52	12		13	Particularly, leguminous cover 12 crops are important sources of easily absorbed nitrogen for crops in rotations and for promoting 13 microbial diversity and soil structure and stability. :better if comphare with other reseach abaot this not only legume	Noted. The discussion on the use of non-leguminous cover crops will be considered and changed accordingly.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21829	52	14			abbreviations at the beginning of a sentence are not allowed	Noted. The sentence will be changed.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
14813	52	26			there shoild also be a mention of the number of years the practice was followed	Acceptd. The table will be reviewed and adjusted accordingly.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
21831	52	39			greenhouse gas already mention before so, just (GHG)	Noted. The use of abbreviations will be reviewed.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
29959	52				What is the meaning of 'ND' in Table 7.9?	Accepted. The table and abbreviations contained within, will be revised.	RAEHYUN KIM	Institute	Republic of Korea
32041	53	43	3	43	the statement: 'natural processes of nitrification and denitrification produce N2O in soils' is not quite correct, there are other processes that also produce N2O in soils (heterotrophic nitrification for example)	Noted. This sentence will be reviewed and revised accordingly.	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
14819	53	19	52	20	emission of N2O is less in organic farminf but generally CO2 emissions are high and if flooding is there CH4 emission also increases	Noted. The section on OF will be entirely revised, including this statement.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
767	53	1	53	2	The results from Gonzalez-Sanchez et al. (2019) are flawed and biased. A comment paper was written to show why and how in 5 different points. In particular, the carbon sequestration rate for CA in woody crops are wrong. As stated in Corbeels et al., (2020), these rates "were estimated from studies on agroforestry systems. In these studies, the control plot is a treeless agricultural plot having the same tillage practice as the agroforestry plot. Therefore, the SOC sequestration rates are due to the presence of trees and are not linked to CA practices". Moreover, the SOC sequestration rates for CA in annual crops are highly overestimated, for different reasons explained in the comment paper. I therefore recommend to remove this table 7.10, especially values for woody crops. If the Lead Authors of this Chapter 7 decide to keep the rates for annual crops under CA, it must be counterbalanced by the more reasonable estimations provided by Corbeels et al 2020. Corbeels, M., Cardinael, R., Powlson, D., Chikowo, R., Gerard, B., 2020. Carbon sequestration potential through conservation agriculture in Africa has been largely overestimated: Comment on: “Meta-analysis on carbon sequestration through conservation agriculture in Africa.” Soil Tillage Res. 196, 104300. doi:10.1016/j.still.2019.104300	Noted. The authors thank the reviewer for pointing this out and providing an associated reference. This will be taken into account during planned major revision of the subsection. It is likely that this table will indeed be removed.	Rémi CARDINAEL	CIRAD	France
8571	53	3	53	3	The units in Table 7.10 have to be modified to Mg ha-1 yr-1.	Noted. The use of units will be revised in all tables.	Eun Jung Choi	National institute of agricultural sciences	Republic of Korea
6735	53	5	53	28	This section is unscientific in its presentation. Without refernces to support it is stated that "OF refers to a process that uses methods respectful of the improve crop quality and reduce GHG emissions." - no definition of organic farming mentions GHG emissions to my knowledge. No indication is given here that yields are normally 20% less under organic farming (even without including the rotations of green manures needed to provide nitrogen) - see Seufert, V., Ramankutty, N. & Foley, J. A. (2012). Comparing the yields of organic and conventional agriculture. Nature 485(7397): 229-232. and de Ponti, T., Rijk, B. & van Ittersum, M. K. (2012). The crop yield gap between organic and conventional agriculture. Agricultural Systems 108: 1-9. - If GHG emissions are calculated per kg product then organic farming generally would lead to greater emissions.	Accepted. This subsection will be extensively revised. The definition of organic farming and yield impacts, and the associated suggested references will be taken into account.	Ken Giller	Wageningen University	Netherlands
9837	53	5	53	28	It might be worthwhile to elaborate more on the topic of organic farming and possibly build a case study for EU organic farming.	Noted. This subsection will be entirely revised. The reviewers point regarding case study is interesting and will be considered.	Jeanne Bormann	Ministry of agriculture	Luxembourg
13419	53	5	53	28	Organic agriculture (or farming) should not be understood as a replacement for other types of agriculture such as conventional agriculture or conservation agriculture. Although sometimes could be a valid option for farmers locally, the OF cannot always replace other systems. Moreover, in many cases and mostly in extensive crops, it could even produce more emissions than a No-till farming system. OF systems do not necessarily contribute to climate change mitigation through better management of nutrients and, hence, the reduction of N2O emissions from soils. Currently, conservation agriculture based on no-till farming, cover crops and crop rotation, considering best practices in terms of integrated pest management and soil nutrition, can be much more effective for this purpose. OF should be understood, not as a replacement model, but only as a complementary option for agriculture worldwide: it should be think of as one more option in terms of productive systems, mainly due to its considerable current limitations in terms of effective adoption as widespread sustainable model. Finally, the quote above despite mentioning efficiency in terms of input/output ratios, do not address OF in terms of productivity per unit of area and how this might compromise or even reduce food potential production worldwide.	Noted and agreed. This subsection will be extensively revised. Discussion on the appropriateness of large-scale adoption of organic farming will be considered. The reviewers points regarding potential increased emissions will also be taken into account as well as potential impacts on yields.	Nelson Illescas	Fundación INAI - Bolsa de Cereales de Buenos Aires	Argentina

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
17933	53	5	53	28	Have not discussed potential drawbacks of organic agriculture such as requiring more land. See https://www.researchgate.net/publication/317630115_Comparative_analysis_of_environmental_impacts_of_agricultural_production_systems_agricultural_input_efficiency_and_food_choice	Accepted. This subsection will be extensively revised and it is hoped a thorough review of literature will allow a comprehensive discussion on organic farming. The authors thank the reviewer for the suggested reference.	Luke Spajic	University of Adelaide (graduate student researcher), University of Oxford (visiting student researcher)	Australia
27349	53	5	53	28	In this subchapter, the trade-off between local and large-scale effects are not well described. This trade relates to the lower yields in organic farming (several papers show this, it is an key discourse) but improved Soil conditions, that bring the scale of produciton into focus. Quite a few papers show that organic farming is advantageous only if it is combined with reductions in animal production/consumption (10.1038/s41467-017-01410-w, 10.1098/rsif.2015.0891)	Noted. This subsection will be extensively revised. It is planned to present a broader discussion on organic farming, including the negative aspects (e.g. yield reductions). Thank you for the suggested reference.	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
28795	53	5	53	28	Organic farming is a consept in conservation agriculture and linked with it, so there is no need to a seprated section. I suggest combin to conservation agricutlure seciton.	Noted. The subsection will be reviewed as part of wider planned changes to the entire section.	Alireza Yazdani	Shiraz University	Iran
37087	53	5	53	28	This section needs to include the latest from scientific literature that shows that crop yields from organic farming are on average lower than conventionally managed systems which will result in an increase in land needed to adequately provide for 10B people. This will lead to an INCREASE in ghg emissions from the ag sector.For example, see Nature Sustainability, 1, 477-485 (2018).	Accepted. Extensive revisions are planned for this subsection. Discussion on potential trade-offs including yield impacts will be included.	Jeffrey Seale	Bayer Crop Science	United States of America
39795	53	5	53	28	The section on organic farming starts with opinions that are not substantiated by evidence or citation. This section only has 2 references, yet there is a large ilterature that could be cited - Vigar, V.; Myers, S.; Oliver, C.; Arellano, J.; Robinson, S.; Leifert, C. A Systematic Review of Organic Versus Conventional Food Consumption: Is There a Measurable Benefit on Human Health? Nutrients 2020, 12, 7., , or as a signpost Abbott, L. K. and Manning, D. A. C. (2015) Soil health and related ecosystem services in organic agriculture. Sustainable Agriculture Research, 4, 112-121, DOI:10.5539/sar.v4n3p116	Accepted. This subsection will be extensively revised. The authors thank the reviewer for the suggested references.	David Manning	Newcastle University	United Kingdom (of Great Britain and Northern Ireland)
46887	53	5	53	28	This chapter is written from a farely optimistic perspective, particularly the first paragraph. I think it is necessary to point at the lower yields of OF compared to conventional systems, higher production costs and prices and eventually risks of ILUC if one assumes unchanged consumption patterns. One particular challenge could be the need for ploughing in OF that may hamper SOC regeneration describe above.	Accepted. This subsection will be extensively revised as part of wider changes to the section. Trade-offs concerning organic farming will be discussed.	Martin Schönhart	University of Natural Resources and Life Sciences, Vienna	Austria
38977	53	6	53	7	Please avoid such sentences, other farming systems do this also.	Accepted. This sentence will be changed.	Vassilis Litskas	Cyprus University of Technology; Open University of Cyprus	Cyprus
1019	53	6	53	10	The definition of organic farming is inappropriate. It reads like propaganda for organic farming, not a dispassionate review of knowledge, especially the sentence “Organic agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved.”	Accepted. This will be revised and definition will provided.	David Powlson	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
22479	53	6	53	10	Is this paragraph useful in a report of this type? It seems to be a statement of the ideals related to organic production.	Noted. The subsection, including its relevance will be reviewed as part of wider planned changes to the section.	Donald Smith	McGill University	Canada
42697	53	6	53	10	References required for definition of organic farming.	Noted. A proper definition will be provided.	Eromose Ebhuoma	University of South Africa	South Africa
9909	53	6	53	28	This section is a very partial and reductive account of the climate merit of organic farming. The carbon footprint of organic products has already been investigated in many studies over the last 15 years, although even reviews and meta-analysis fail to come to a consensual conclusion. Mondelaers et al. (2009) finds that the carbon footprint of organic products is worse than conventional ones, whereas Meier et al. (2015), Tuomisto et al. (2012) and Clark and Tilman (2017) are inconclusive, arguing that the result may depend on product types. Most interestingly, Meier et al. (2015) concludes that it is not yet possible to draw a conclusive picture on the topic, because detailed calculation methods and parameters – often not fully transparent in published articles – likely overlook important differences between organic and conventional production. Bellassen et al. (under review in JAFIO), using a consistent methodology over various products, finds that organic animal products are not significantly different from their conventional counterparts while organic vegetal products have a median 16% lower carbon footprint. Biomass and soil carbon changes have also not been considered in these studies. These changes are indeed negligible when land use and management is kept constant over long time periods (IPCC, 2006; Pellerin et al., 2019). This is not true however in the first decades following change. Thus, organic farming has been shown to increase soil carbon stocks by an average 0.07-0.27 tC ha-1 year-1, although this is likely an indirect consequence of higher manure inputs and crop rotations than a direct eflfect of the technical specifications (Gattinger et al., 2012). In addition, conversions from conventional systems to FQS would, in many cases, involve sowing grasslands over cropland which would increase soil carbon stocks (Lambotte et al., submitted). To the contrary however, such conversions would often result in decreasing yields, which in turn are predicted to have a negative effect on biomass and soil carbon stocks through indirect land-use changes (Bellora and Bureau, 2016; Searchinger et al., 2018). Therefore, there is no obvious prediction as to how including biomass and soil carbon changes would impact these results. Finally, the diet of consumers eating a higher share of organic products has been shown to contain fewer animal-based products, incidentally leading to a lower carbon footprint of the diet as a whole (Baudry et al., 2019; Lacour et al., 2018).	Noted and accepted. The authors thank the reviewer for their suggested discussion and associated references. Most useful indeed. This subsection will be extensively revised and the reviewer's suggestions will be taken into account during revisions.	Valentin Bellassen	INRAE	France

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
46539	53	6	53	28	This section on organic agriculture is welcome since it has not received as much attention in previous IPCC reports, but needs more strengthening with additional recent studies. Note as well that organic agriculture excludes not just mineral fertilizers but herbicides and pesticides which also contribute GHGs. For additional studies see for example García PP, Gattinger A, Bracht JH, et al. Crop traits drive soil carbon sequestration under organic farming. Journal of Applied Ecology. 2018;55(5):2496-2505. doi:10.1111/1365-2664.13113.; Aguilera E, Lassaletta L, Gattinger A, Gimeno BS. Managing soil carbon for climate change mitigation and adaptation in Mediterranean cropping systems: A meta-analysis. Agriculture, Ecosystems and Environment. 2013;168:25-36. doi:10.1016/j.agee.2013.02.003.	Accepted. This subsection will be extensively revised. As part of planned changes, it is intended to provide a more comprehensive and thorough assessment of literature. The authors thank the reviewer for the suggested references.	Rachel Bezner Kerr	Cornell University	United States of America
17521	53	7	53	10	This seems like a biased and overly-generous definition of organic agriculture. Organic agriculture simply means agriculture that does not use synthetic chemical inputs. The positive outcomes mentioned (e.g. fair relationships, good quality of life) can be found in organic farms and in farms that make use of synthetic chemicals. It is incorrect to attribute these outcomes to the 'organic farming' itself. These outcomes may be more common in organic farm systems- but evidence would need to be present to support this. However, the main focus should be on mitigation, If these outcomes are important for mitigation- then this need to be emphasised separately to organic farming.	Noted. This subsection will be extensively revised. A new definition of organic farming will be provided. Discussion on potential co-benefits, trade-offs and specifically, mitigation capacity of organic farming will be included, with discussion based on a thorough review of literature.	Aidan Farrell	The University of the West Indies	Trinidad and Tobago
22481	53	12	53	12	Change "improve" to "the environment and diversity to improve"	Accepted. This sentence will be improved.	Donald Smith	McGill University	Canada
36663	53	12	53	12	The para may start as the OF	Noted. This paragraph will be re-written.	NARESH KUMAR SOORA	Indian Agricultural Research Institute	India
1021	53	12	53	13	The definition of organic farming is inappropriate. It reads like propaganda for organic farming, not a dispassionate review of knowledge, especially the sentence "Organic agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved."	Accepted. A new definition of organic farming will be provided.	David Powlson	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
9833	53	12	53	21	Check if no more recent study or meta-analysis is available on this topic (Lynch et al., 2011; Gomiero et al., 2008)	Accepted. A thorough review of recent literature on the topic will be conducted.	Jeanne Bormann	Ministry of agriculture	Luxembourg
17523	53	12	53	21	Some very strong statements being made here based on two papers both more than nine years old. Needs much more evidence to support.	Accepted. This subsection will be extensively revised. As part of this, a thorough review of recent literature will be conducted.	Aidan Farrell	The University of the West Indies	Trinidad and Tobago
26913	53	12	53	21	It would be nice to see a robust assessment of the literature on OF with the IPCC drawing solid conclusions on its potentia impact on the atmosphere. This requires looking at the available literature and drawing conclusions with typical IPCC uncertainty language. This section is a start, the authors should go further.	Accepted. This subsection will be extensively reviewed. It is planned to conduct a thorough review and associated IPCC assessment of literature.	Louis Verchot	International Center for Tropical Agriculture	Colombia
29177	53	12	53	21	OF has benefits in terms of emissions, However what about the yields which may impact negatively. Further input on this issue would be helpful	Noted. The subsection will be entirely revised. Discussion on yield penalties will be included.	SMAIL KHENNAS	Energy and Climate Change Consultant	United Kingdom (of Great Britain and Northern Ireland)
30617	53	12	53	21	This paragraph needs to provide more nuance about the land-sparing vs. land-sharing debate. Although the lower yields per hectare associated with OF are briefly mentioned, the potential implications on climate mitigation and other environmental impacts should be more thoroughly and evenly discussed. See, for example (there are many reviews on the topic): Fischer et al (2014). Land sparing versus land sharing: moving forward. Conservation Letters, 7(3), 149-157.	Noted. The subsection will be extensively revised. It is planned to discuss potential trade-offs more thoroughly. The authors thank the reviewer for the suggested reference.	Raychel Santo	Johns Hopkins Center for a Livable Future, Bloomberg School of Public Health	United States of America
38979	53	12	53	21	I feel that the two references that the paragraph is based are old.	Accepted. A review of recent literature will be conducted.	Vassilis Litskas	Cyprus University of Technology; Open University of Cyprus	Cyprus
22483	53	13	53	13	Change "generally" to "farming generally results in"	Accepted. This sentence will be revised.	Donald Smith	McGill University	Canada
22485	53	14	53	14	Change "variable" to "produces variable"	Noted. Thank you. This sentence will be revised.	Donald Smith	McGill University	Canada
20651	53	17	53	20	Here, the text makes the unabiguous assertion that OF reduces N2O and CO2 emissions. However, just 2 sentences prior (on lines 12:15) a more nuanced statement says that OF has lower GHG emissions per Ha but variable results per unit of product. This statement has to be further dissected in order to make clear the true mitigation potential of OF. One could argue that since we want to produce a given ammount of food to feed the world, the "per unit of product" metric is more useful, thus calling into question the mitigation potential of OF. This would be further affected negatively by potential land expansion and indirect land use change if OF offers low(er) yields than other options. I'm not trying to destroy OF, but rather highlight the nuances which should be better discussed in this (and other) sections in order to provide clear advice as to mitigation potentials, and the trade-offs and synergies of different land-use strategies. Perhaps and idea is to have a figure/table with the pros/cons/tradeoffs/synergies/costs/potentials of different mitigation measures?	Noted. This subsection and indeed the entire section on mitigation options will be extensively revised. It is planned to present a more balanced discussion on organic farming, highlighting some of the potential trade-offs. The reviewer's suggestion of a table is noted. A similar table assessing the feasibility of mitigation measures is planned and should be presented in 7.6.	Vassilis Daioglou	Copernicus Institute of Sustainable Development	Netherlands
30619	53	20	53	21	Explain more and provide source for this statement. Does the reduction of pestcides affect the amount of soil biomass that indirectly increases C sequestration rates?	Noted. This sentence / statement will be revised as part of wider planned changes to the subsection.	Raychel Santo	Johns Hopkins Center for a Livable Future, Bloomberg School of Public Health	United States of America

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
30621	53	21	53	21	"Toxic" is a loaded term without a scientifically rigorous defense in this instance. Additionally some "organic"/non-synthetic pesticides are also "toxic" to humans.	Accepted. Use of the term toxic will be reviewed.	Raychel Santo	Johns Hopkins Center for a Livable Future, Bloomberg School of Public Health	United States of America
1023	53	23	53	28	This section needs some revision, taking account of points made by Leifeld et al (2013) “Organic farming gives no climate change benefit through soil carbon sequestration. Proceedings of the National Academy of Sciences of the United States of America 110, E984.” DOI 10.1073/pnas.1220724110 . These authors drew attention to (a) increases in soil C in organic systems are, in part, due to C inputs from manure produced elsewhere so not an additional net transfer of C from atmosphere to land and (b) lower crop yields in organic systems compared to conventional have implications for food security and land use as additional land may be required to compensate for lost production. As it stands, the current text is superficial.	Accepted. The subsection will be extensively revised. The authors thank the reviewer for the suggested reference. A more comprehensive discussion on the benefits and trade-offs of organic farming will be presented.	David Powlson	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
26915	53	23	53	28	Muller also showed that OF required more land to produce food, so the tradeoff needs to be made apparent.	Noted. The subsection will be extensively revised.	Louis Verchot	International Center for Tropical Agriculture	Colombia
22487	53	25	53	25	Change "till" to ", at least until"	Noted. Thank you. This sentence will be revised.	Donald Smith	McGill University	Canada
9835	53	26	53	28	Does this refer to the same study (Muller et al., 2016)?	Noted. As part of extensive planned revision of the subsection, all references and associated conclusions will be checked.	Jeanne Bormann	Ministry of agriculture	Luxembourg
20653	53	26	53	28	This statement has to be made clearer. Global emission reduction by abstaining from using fertilizers is 20%? 20% of ALL anthropogenic emissions? I find that very hard to believe. And a further 40-72% of annual agricultural emissions are offset via carbon sequestration. These two numbers together make the avoidance of fertilizer use the single most important climate change mitigation measure - by far. I must have misunderstood something.	Noted. This subsection and specifically this sentence will be revised.	Vassilis Daioglou	Copernicus Institute of Sustainable Development	Netherlands
30623	53	26	53	28	source for this? Also does this mean sequestration potential from all forms of food production? Additionally is this potential limited by a certain timeframe?	Noted. This sentence will be revised as part of wider planned changes to the subsection.	Raychel Santo	Johns Hopkins Center for a Livable Future, Bloomberg School of Public Health	United States of America
27205	53	27	53	27	What is the reference for this number (20%)? It seems in contradiction with Table 7.13 in which mineral fertilizers contribute to 11.5% of the agricultural non CO2 emission	Noted. This sentence / statement will be revised. Associated references will be used as appropriate.	Marc Aubinet	University of Liege	Belgium
27207	53	27	53	27	What is the reference for this number (40-72 %)? It is anyway clear that this potential overlaps those presented before (sections on soil carbon sequestration and conservation agriculture).	Accepted. This sentence will be revised and references will be provided as appropriate.	Marc Aubinet	University of Liege	Belgium
22489	53	35	53	35	Change "source" to "sources"	accept, editorial	Donald Smith	McGill University	Canada
22491	53	35	53	35	Change "methane" to "methane being larger"	accept, editorial	Donald Smith	McGill University	Canada
10471	53	35	53	36	Source/citation? Uncertainty?	accept, editorial	Andy Reisinger	NZAGRC	New Zealand
27209	53	39	53	41	There are two errors in this sentence : 1) I would write "N2O emissions increase significantly faster with N inputs for..." rather than "N2O response to N inputs increase significantly faster than linear for..." The non linear behaviour of emission is not limited to synthetic fertilizers. 2) It is not true that N2O emission is larger for synthetic fertilizers, in average: Figure 2 b in the reference shows that average emission by synthetic fertilizers is not significantly different from global average and from manure emissions. Besides, it's true that emission from ammonium nitrate (one type of synthetic fertilizer) is more than twice as high.	accept, we will check this	Marc Aubinet	University of Liege	Belgium
28323	53	43	53	43	I suggest to add at the end of the sentence : while the last step of the denitrification process allows to reduce N2O into N2	accept, we will check this	catherine Hénault	INRAE	France
12271	53		53		Inclusion of values for conventional practices for comparison is desirable to better understand the extent of benefits out of conservation agriculture.	Noted. It is likely that this table will be removed as part of planned changes to the subsection.	Mohammad Ibrahim Khalil	University College Dublin	Ireland
20055	53	30	54	20	This section on crop nutrient management is far too short, starts too general with information already mentioned in earlier parts of the text, and doesn't mention many important options, like plant breeding, the use of legumes, improved fertiliser applciation technologies, precision farming and so on.	accept, we will check this	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
22183	53	30	54	20	Good Fertization Practices (GFP), especially N fertilizer in oil palm plantation is also environmentally important. While for paddy, the implementation of Sytem Rice Intensification (SRI) also can increase fertilizer use efficiency, hence, decrease N20 emission	accept, we will check this	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
39797	53	30	54	20	This section only deals with nitrogen management. It should be stated at the outset that this is so, and that other fertilizer minerals are not considered (eg P, K), so their effects are not considered.	accept, we will check this	David Manning	Newcastle University	United Kingdom (of Great Britain and Northern Ireland)
21833	53	1		4	Table 7.10 better if refresentative for several region	Noted. It is likely that this table will be removed as part of planned changes to the subsection. However, the reviewers' comment is noted.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
14817	53	3			hectare is represented as ha.	Noted. Thank you.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
3477	53	5		28	This paragraph is not deep enough. Indeed, the issue of organic is very important, and must be dealt with differently depending on the place. European or African conclusions might not be the same (see R. Auerbach, Organic Food systems, CABI, 2019). The topic of organic is complex and desserves more explanations.	Accepted. This subsection will be extensively revised. The authors thank the reviewer for the suggested reference.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
10469	53	5			This section falls well short of the available literature on OF and their carbon footprints. There are plenty of studies that can and need to be assessed before arriving at conclusions, rather than relying on only 3 references, two of which are from before the AR5 - e.g. the sentence "Nitrous oxide and carbon dioxide emissions were clearly lower on organic farms (Gomiero et al 2008)" - a single, old reference to make such a generic claim? And what is the unit of measurement (emissions per ha, or per product)? What about methane emissions from enteric fermentation? What about the overall potential/scale, what about the cost?	Accepted. This subsection will be extensively revised. As part of this, a thorough literature review will be conducted.	Andy Reisinger	NZAGRC	New Zealand
3473	53	6		10	would be better set in the introduction of the section 7.5	Noted. This paragraph will be revised as part of planned changed to the entire section. It inclusion in the section introduction will be considered.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
3475	53	12		13	This sentence disserves citations, and acknowledgements that about half of the published studies find that OF is producing more CO2 per unit of weight, and leakage of production must be accounted for (Smith, L.G., Kirk, G.J.D., Jones, P.J. et al. The greenhouse gas impacts of converting food production in England and Wales to organic methods. Nat Commun 10, 4641 (2019). https://doi.org/10.1038/s41467-019-12622-7). Nevertheless, when introducing the quality of nutrients, OF often performs better.	Noted. The sentence will be revised as part of wider planned changes for the entire subsection. It is planned to review recent literature and include additional references.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
3479	53	12			improvement of	Noted. This sentence will be revised.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
21835	53	12			OF?	Noted. This sentence will be changed.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
17809	53	14		15	It would be better to add the cause of "... But variable results for energy use and GHG emissions per unit of product."	Noted. This sentence will be revised.	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
21837	53	17			OF?	Noted. The use of 'OF' will be revised.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
3481	53	20		21	This sentence must be explained and claims for a reference.	Accepted. The sentence will be revised. Additional references will be included accordingly.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
43283	53	21			need some evidence to support the idea that 'no toxic pesticides' results in higher carbon sequestration. On the face of it, I can't see how that would work.	Accepted. This statement / passage will be thoroughly revised.	Deborah Lawrence	University of Virginia	United States of America
5925	53	22			Having this section here specifically on bioenergy is OK but there has been considerable discusion of the potential for biomass/ bioenergy in many of the preceeding sections yet without any cross-reference to this section. There is also much duplication so some editing is required. Also has there been LA interaction with Chapter 6 LAs covering this same topic?	Noted. The subsection on bioenergy will be extensively revised as part of planned wider changes to the entire section. Coordination with other chapters is also underway.	Ralph Sims	Massey University	New Zealand
3483	53	25			CO2e instead of CO2-eq	Noted. The use of units will be revised.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
29725	53	26			Muller et al. 2016; Add this article to the reference	Noted. Thank you.	RAEHYUN KIM	Institute	Republic of Korea
21839	53	28			GHG?	Noted. The use of abbreviations will be reviewed.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21841	53	31		41	shoud be 1 paragraph	accept, editorial	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
29573	53	32			Dickie et al. 2014; Add this article to the reference	accept, editorial	RAEHYUN KIM	Institute	Republic of Korea
29643	53	32			Hawken 2017; Add this article to the reference	accept, editorial	RAEHYUN KIM	Institute	Republic of Korea
32043	54	1	54	1	the phrase: 'Better timing of fertilization' should say 'Better timing and optimal rates of fertilization	accept, editorial	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
38851	54	1	54	4	In addition to timely application of fertilizers, an understanding of the relationship between crop N uptake and growth response is important since there is a plateau of N uptake even with additional fertilizer application. This nitrogen dilution curve can be an important tool in decision making. Moreover, this information on crop N uptake can be helpful in Earth systems models or dynamic growth vegetation models which include nitrogen. See the following papers: Justes et al. (1994) Determination of a critical nitrogen dilution curve for winter wheat crops. Annals of Botany; Zaehle S, Dalmonech D (2011) Carbon–nitrogen interactions on land at global scales: current understanding in modelling climate biosphere feedbacks. Curr Opin Environ Sustain 3:311–320.; Reyes et al. (2015) Improved estimation of nitrogen uptake in grasslands using the nitrogen dilution curve. Agronomy for Sustainable Development.	accept, we will check and update	Julian Reyes	Personal Capacity	United States of America

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
1495	54	1	54	15	Liu et al. (2016) calculated that the total N input (TN) of global food production was 171 Tg N yr−1 in 2000. The production of animal products accounted for over 50% of the TN, against 17% for global calories production. Increased animal production will have the largest impact on increasing TN, which calls for new food production systems with better N-recycling, such as cooperation between crop and livestock producing farms. Increased N-use efficiency, healthier diet and decreased food waste could mitigate this increase and even reduce TN in 2030 by 8% relative to the 2000 level. Hence, we should not only care about nitrogen for crop production, but also that for animal production. Liu J., Ma K., Ciais P., Polasky S., 2016. Reducing human nitrogen use for food production. Scientific Reports 6: 30104.	accept, we will check and update	JUNGUO LIU	Southern University of Science and Technology	China
2927	54	6	54	6	Nitrous oxide emissions from soils depend significantly on type of fertilizer (urea, ammonium nitrate etc.) and fertilizer application technique (e.g. broadcasting, injection, aerial etc.). It would be beneficial to elaborate more on implications for emission reduction.	accept, we will check and update	Yurii Pyrozhenko	IPCC TFI TSU	Japan
10545	54	7	54	14	More references can be added for nitrification inhibitors. 1) Akiyama, H., Yan, X. & Yagi, K. (2010) Evaluation of effectiveness of enhanced-efficiency fertilizers as mitigation options for N2O and NO emissions from agricultural soils: meta-analysis. Global Change Biology 16(6): 1837-1846., 2) Gilsanz, C., Baez, D., Misselbrook, T. H., Dhanoa, M. S. & Cardenas, L. M. (2016) Development of emission factors and efficiency of two nitrification inhibitors, DCD and DMPP. . Agric. Ecosyst. Environ. 216: 1-8. 3) Yang M, Y Fang, D Sun & Y Shi, Efficiency of two nitrification inhibitors (dicyandiamide and 3,4-dimethypyrazole phosphate) on soil nitrogen transformations and plant productivity: a meta-analysis, Scientific Reports | 6:22075 | DOI: 10.1038/srep22075	accept, we will check and update	Hiroko Akiyama	National Agriculture and Food Research Organization	Japan
10547	54	7	54	14	More reference can be added for polymer coted fertilizers. 1) Akiyama, H., Yan, X. & Yagi, K. (2010) Evaluation of effectiveness of enhanced-efficiency fertilizers as mitigation options for N2O and NO emissions from agricultural soils: meta-analysis. Global Change Biology 16(6): 1837-1846., 2) Xia L, S Lam, D Chen, J Wang , Q Tang and XY Yan, Can knowledge-based N management produce more staple grain with lower greenhouse gas emission and reactive nitrogen pollution? A meta-analysis, Global Change Biology (2016), doi: 10.1111/gcb.13455	accept, we will check and update	Hiroko Akiyama	National Agriculture and Food Research Organization	Japan
12273	54	7	54	14	Nitrification inhibitor (NI) retards nitrification to occur and keep its form as AMMONIUM (not ammonia) and that prevent nitrification, not denitrification. This creates opportunities to uptake both ammoinium and nitrate before dentrification/leaching to occur. Need to rephrase this and simialr sentences.	accept, we will check and update	Mohammad Ibrahim Khalil	University College Dublin	Ireland
14821	54	7	54	14	The negative impact of use of NI is increased volatilisation losses to the atmosphere. The rate may vary depending upon the climate, soil pH and water management practices followed.	accept, we will check and update	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
10473	54	7	54	20	This is all text-book material, but no assessment of costs, potentials etc	accept, we will check and update	Andy Reisinger	NZAGRC	New Zealand
22493	54	8	54	8	Delete "highly"	accept, editorial	Donald Smith	McGill University	Canada
22495	54	8	54	8	Change "to" to "for"	accept, editorial	Donald Smith	McGill University	Canada
32045	54	8	54	8	Nitrification inhibitors (NI) should also refer to urease inhibitors (UI) in the case of urea application	accept, editorial	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
2925	54	15	54	15	Indeed, nitrification inhibitors reduce nitrate leaching to soils. But at the same time their usage increase amount of ammonia volatilized (e.g. from the most widely used N fertilizer urea). Considering that NH3 is an aerosol precursor and source of indirect N2O emissions, possible options to reduce ammonia losses from usage of NI should be outlined, e.g. by adding the following text: "On the other hand, inhibition of nitrification leads to increase in ammonia emissions. For instance, NH3 losses from the most widespread fertilizer urea average 16% of N applied worldwide and can reach 40% or more in hot and humid conditions (Cantarella et al. 2018; https://doi.org/10.1016/j.jare.2018.05.008). Usage of nitrification inhibitors in combination with urease inhibitors offsets NH3 losses to some extent. Based on results of four independent meta-analyses (https://doi.org/10.1016/j.fcr.2013.08.014; https://doi.org/10.1016/j.agee.2014.03.036; https://doi.org/10.1016/j.jare.2018.05.008; doi:10.2134/agronj2016.04.0200 https://doi.org/10.1016/j.agee.2016.08.019), nitrification inhibitors increased and urease inhibitors decreased ammonia volatilization by 38% and 52-54% respectively (i.e. net reduction in NH3 emissions of about 15% can be achieved). Urease inhibitor usage can be considered as multi-beneficial mitigation measure: 1). Yield increase by 5-12% (Cantarella et al. 2018). 2). Reduction of indirect N2O emissions from atmospheric deposition of N volatilized as NH3 from managed soils. Moreover, swithing e.g. from calcium ammonium nitrate to urea stabilized with nitrification and urease inhibitors can be considered as efficient nitrous oxide mitigation technique with reduced fertilizer costs, particularly in wet temperate grassland (https://doi.org/10.1016/j.scitotenv.2016.04.120).	accept, we will check and update	Yurii Pyrozhenko	IPCC TFI TSU	Japan
28325	54	15	54	15	I suggest to add at the end of the paragraph :" The promotion of the N2O reduction by liming acidic soils (Hénault et al., 2019 ; Shaaban et al., 2015) or by the use of rhizobia possessing the nosZ gene in legume crops (Hénault et Revellin, 2011 ; Sameshima-Saito et al., 2006) can also mitigate soil N2O emission.	accept, we will check and update	catherine Hénault	INRAE	France
22497	54	16	54	16	Change "approach" to "approaches"	accept, editorial	Donald Smith	McGill University	Canada
22499	54	16	54	16	Is IPNI defined? This applies to some of the other acronyms as well.	accept, editorial	Donald Smith	McGill University	Canada

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
32047	54	16	54	16	I am not sure the '2R' approach has been described earlier	accept, editorial	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
22501	54	20	54	20	Change "plan" to "planning"	accept, editorial	Donald Smith	McGill University	Canada
2929	54	21	54	21	Management of soil pH can be considered as one of mitigation strategies. Liming decreases nitrous oxide emissions but at the same time increases CO2 emissions. Nevertheless, increasing soil pH by adding lime in science-based amount leads to positive yield response and is recommended by some studies as a strategy for reduction of nitrous oxise emissions from acidic soils (only from nitrification). Please refer to: http://dx.doi.org/10.1016/j.soilbio.2013.02.014; https://doi.org/10.1038/s41598-019-56694-3.	accept, we will check and update	Yurii Pyrozhenko	IPCC TFI TSU	Japan
32883	54	23	54	31	Given the rapid increase and drop in price in the electric vehicle, the demand for gasoline is forecasted to be less compared to the forecast made 3 years ago. The demand for biofuel is more likely in the form of jet fuel and diesel. The overall demand for liquid fuel needs to be updated with newer literature and estimates.	reject, we don't do the demand scenario here. we view this from supply side. demand is covered in transport chapter, these will be coordinated. and the section will be improved by CA Daioglou	Cheah Singfoong	Independent consultant, formerly more than 10 years with the National Renewable Energy Laboratory, USA	United States of America
32983	54	23	54	31	Both China and European targets are in the past, once the report will be published. Wouldn't it be more useful to put either follow-up targets or an assessment of the targets instead?	reject, we don't do the demand scenario here. we view this from supply side. demand is covered in transport chapter, these will be coordinated. and the section will be improved by CA Daioglou	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
46681	54	23	54	31	This paragraph considers evident that substituting bioenergy for fossil fuel will decrease emissions. This needs to be seriously discussed, because when wood is burned in power plants, both because of its lower burning temperature and its high carbon content, it produces far more carbon than burning fossil fuels for each kilowatt hour of electricity produced. The result is a large carbon debt, with emissions often three-times or more those of burning fossil fuels. There is also an issue of timescale: immediate emissions due to wood burning are not immediately compensated by the slow carbon uptake by growing wood. The scientific basis for this can be found, e.g., in Searchinger et al. (2018) “Europe’s renewable energy directive poised to harm global forests,” Nature Communications 9:3741 https://www.nature.com/articles/s41467-018-06175-4 and references therein.	partly accept, reviewer gives commentaries as scientific refs. we will balance the sections on bioenergy better. Issues of timing and carbon debt will be explicit in SOD.	Jean-Pascal van Ypersele	Université catholique de Louvain	Belgium
20655	54	25	54	26	Have the Chinese and European targets been met?	reject, we don't do the demand scenario here. we view this from supply side. demand is covered in transport chapter, these will be coordinated. and the section will be improved by CA Daioglou	Vassilis Daioglou	Copernicus Institute of Sustainable Development	Netherlands
9839	54	25	54	27	As the event has already taken place, it is suggested to countercheck the achieved targets (compared to the set-out target values).	reject, we don't do the demand scenario here. we view this from supply side. demand is covered in transport chapter, these will be coordinated. and the section will be improved by CA Daioglou	Jeanne Bormann	Ministry of agriculture	Luxembourg
22503	54	26	54	26	Thre reference to projections into 2017 is now all in the past	accept, the section will be improved by CA Daioglou	Donald Smith	McGill University	Canada
4929	54	26	54	27	Pls provide a reference for the US related targets and specify whether they related to 1G or 2G biofuels or other	Restructured chapter will not focus on existing policies, rather emission reduction potentials of bioenergy and BECCS	Patrick Lamers	National Renewable Energy Laboratory	United States of America
22505	54	27	54	27	One could do sustainable use of crop residues (not more than 1/3 taken per year) and production of biomass crops on more marginal lands will little expansion of intensive crop production on best soils.	accept, the section will be improved by CA Daioglou. Explicit assessment of residues will be included in SOD.	Donald Smith	McGill University	Canada
16637	54	33	54	33	on bioenergy there are residue based systems, marginal lands based systems and dedicated energy crops plus use of commercial crops and timber. I think energy cros may well be land use change as is marginal land use. You might comment on those	Accept. Explicit assessment of bioenergy potentials from (i) crops, (ii) residues, (iii) forestry will be included in SOD. Try to include something about using degraded lands, literature permitting.	Bruce McCarl	Texas A & M University	United States of America
32985	54	33	54	33	Where does the 1% number come from? Reference?	accept, the section will be improved by CA Daioglou	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
17137	54	33	54	35	It is helpful if you could add more detail information on "very small percetage of over all changes". Indonesian and Malaysian gouvernment may have signifcant priority on this information because these countries are criticized by European countries for land use change caused by oil plam plantation for the bioenergy.	Restructured chapters focusing on regional potentials will exclude this argumentation.	KEIICHI IGARASHI	Mitsubishi UFJ Research and Consulting Co., Ltd.	Japan
4931	54	34	54	34	"very small percentage" needs to be made explicit, i.e., how much in which period and is this empirical or modeled (satellite imagery?) and a related reference.	Restructured chapters focusing on regional potentials will exclude this argumentation.	Patrick Lamers	National Renewable Energy Laboratory	United States of America

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
4933	54	36	54	36	Suggest to include "Intercropping of" lignocellulosic feedstock	accept, the section will be improved by CA Daioglou	Patrick Lamers	National Renewable Energy Laboratory	United States of America
26917	54	37	54	40	Marginal lands are marginal, they are unproductive. Cultivation of bioenergy crops on marginal land is often proposed as a means of avoiding competition for land, but it ignores that economic production of crops requires good productivity. If you look at where bioenergy is being produced today, it is not on marginal lands, mostly. So rather than repeat platitudes, it would be worthwhile assessing them and providing uncertainty language around feasilility. The statements also create the impression that bioenergy does not result in land use change. However, that is not the reality on the ground and this is well documented in the literature. Bioenergy can promote displacement of current activities and lead to increased deforestation. A critical look at these issues would be a contribution to the debate.	partly accept, the section will be improved by CA Daioglou	Louis Verchot	International Center for Tropical Agriculture	Colombia
4937	54	40	54	40	"does often not" should be revised	accept, editorial	Patrick Lamers	National Renewable Energy Laboratory	United States of America
22507	54	42	54	42	Change "sustainable" to "sustainably"	accept, editorial	Donald Smith	McGill University	Canada
4935	54	49	54	49	footnote 3 is missing and I encourage explaining how the forest residue volume was calculated.	accept, editorial	Patrick Lamers	National Renewable Energy Laboratory	United States of America
12163	54	49	55	4	Please consider to note, in line with SRCCL SPM B7.3, that supplies of residues is limited and should not be at the expense of the recycling of such residues back to the soils and ecosystems.	accept, the section will be improved by CA Daioglou	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
32987	54	49	55	4	It is not clear where the numbers come from? Is it Pour et al.? Should be clarified and referenced accordingly.	accept, the section will be improved by CA Daioglou	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
35891	54	49	55	4	The paragraph on residue biomass available is devoid of references and does not cover the vast body of literature on biomass resources, how they are estimated. One place to start is with Slade, R., et al. (2014). "Global bioenergy resources." Nature Climate Change 4(2): 99-105; and Daioglou, V., et al. (2016). "Projections of the availability and cost of residues from agriculture and forestry." GCB Bioenergy 8(2): 456-470, but there is much more than this published since AR5.	accept, the section will be improved by CA Daioglou	Niclas Scott Bentsen	University of Copenhagen, Department of Geosciences and Natural Resource Management	Denmark
41391	54	22	56	6	Why does this chapter not mention traditional biomass, which is used by billions of people for their household energy needs?	Chapter focuses on the use of modern biomass as a climate change mitigation measure. Traditional biomass use of poor and energy insecure households is not included in this definition.	Cecilia Sundberg	Swedish University of Agricultural Sciences	Sweden
6249	54	22	56	9	Thus BE will be not endorsible solution for food sequrity, eradicate poverty, efficient land use, CO_2 removal.	SOD will have a greater elaboration on the importance of time scales and role of BECCS.	Seokhwan Jeong	Kongju National University Graduate School	Republic of Korea
18167	54	22	56	9	Very weak section covering probably the most contested issue that needs to be discussed in this chapter. No clear storyline, largely consists of seemingly unrelated factual statements on arbitrarily chosen parts of the world, assembled one after the other. In my view, such a section that covers a highly contested issue needs a clear structure and aim to organize the insights generated in the past 1-2 decades and published in probably tens of thousands of papers in the peer-reviewed literature following a logical structure. In my view, the burning question to be answered here is how much bioenergy can be generated in the future globally (1) under what circumstances, i.e. under which future trajectories of the global land system, in particular in terms of land demand for the food system, (2) what are the ecological and GHG costs of producing this biomass, (3) and what are the economic (monetary) costs of that biomass (4) and what are the tradeoffs with other important societal/sustainability goals. As we have recently shown (Kalt et al., 2020, Env Res Lett, https://doi.org/10.1088/1748-9326/ab6c2e) there exist relatively small potentials of GHG-negative bioenergy (e.g. use of manure for biogas), and GHG costs of bioenergy per energy unit (i.e. marginal GHG costs of producing bioenergy) rise with the amount of bioenergy to be produced. The form of this GHG-cost curve of bioenergy depends on framework conditions, in particular on land demand of the food system (Haberl 2013, Global Change Biology Bioenergy, 5, 351-357 (doi: 10.1111/gcbb.12071). In my view, a very useful task of this section could be to assess how much biomass of what type (residue from agriculture, wastes, purpose-grown energy crops, increased biomass extraction from forests, etc) could be expected to be available globally under a couple of plausible scenarios for the food/agriculture system, and at what GHG costs. Opportunity costs of using land for biomass vs. other potentially climate-beneficial purposes must not be neglected (e.g. see Kalt et al. 2019, Global Change Biology Bioenergy, 11, 1283–1297. doi: 10.1111/gcb.12626), nor the full C effects of extracting more wood from forests (see large literatures on the forest C debt of harvesting more wood). In my view, attention at the highest level of WGIII (up to the co-chair level) is required to ascertain that the next version is up to IPCC standards.	partly accept, reviewer has a strong bias on bioenergy . Section will be restructured to show different primary potential types, and how they can contribute to emission mitigation	Helmut Haberl	Institute of Social Ecology, University of Natural Resources and Life Sciences, Vienna	Austria

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
20663	54	22	56	9	This section seems very weak with disjointed information and little insight. Bioenergy and BECCS are one of the few aspects of long term mitigation scenarios which has been given extensive anlysis the past few years, with a plethora of results available on online databases, such as that of the SR15. One of the problems with bioenergy and its location in this section of the report is that it is not a measue that offers a reduction in AFOLU emissions. But rather a land based measure which reduces Energy system emissions. As far as I have seen, this has not been properly explained anywhere in the report. It has to be made clear and it role and emissions given the proper contextualisation. I would expect this sections to provide explanations into the following important issues: - BECCS: Why is it so important in IAM sceanrios? At what level is it used? What is its implication concerning mitigation strategies (i.e. if there was no BECCS, how do mitigation strategies change?) - Bioenergy supply: Where do IAMs assume biomass comes from in mitigation scenarios? Lignocellulosic crops? 1st generation? Residues? What are the supply regions? - What is the resultant land-use? What are the main uncertainties? - What are the implications on food supply? - What are the limiting factors/synergies/tradeoffs. How do bioenergy futures interact with overall land-use and food demand futures (i.e. scenarios with protection of land based carbon stocks and increased agricultural producctivity, can supply large ammounts of biomass with limited LUC emissions). - How does the modelled use of bioenergy contrast with current systems? - How do the GHG consequences of biomass supply compare with the emissions of the fossil energy counterparts they aim to replace? - How important are amortization periods when looking into the GHG effects of land use change and the mitigation potential of bioenergy? A lot of literatrue has been published (or is under review) concerning the above. Particularily the EMF-33 project provided a plethora of results (available on the SR15 database) specifically on the use of biomass and bioenergy in mitigation scenarios. LITERATURE: Online database or IAM results: Huppmann, D., Rogelj, J., Kriegler, E., Krey, V., & Riahi, K. (2018). A new scenario resource for integrated 1.5° C research. Nature climate change, 8(12), 1027-1030. EMF-33 overview: Bauer, N., Rose, S. K., Fujimori, S., Van Vuuren, D. P., Weyant, J., Wise, M., ... & Kitous, A. (2018). Global energy sector emission reductions and bioenergy use: overview of the bioenergy demand phase of the EMF-33 model comparison. Climatic Change, 1-16. Supply and use of residues in mitigation scenarios: Hanssen, S. V., Daioglou, V., Steinmann, Z. J., Frank, S., Popp, A., Brunelle, T., ... & Van Vuuren, D. P. (2019). Biomass residues as twenty-first century bioenergy feedstock—a comparison of eight integrated assessment models. Climatic Change, 1-18. Daioglou, V., Stehfest, E., Wicke, B., Faaij, A., & van Vuuren, D. P. (2016). Projections of the availability and cost of residues from agriculture and forestry. Gcb Bioenergy, 8(2), 456-470. Mouratiadou, I., Stella, T., Gaiser, T., Wicke, B., Nendel, C., Ewert, F., & van der Hilst, F. (2020). Sustainable intensification of crop residue exploitation for bioenergy: Opportunities and challenges. GCB Bioenergy. Bioenergy across different socio-economic pathways - uncetainties concerning land-use and technological futures:	accept, the section will be improved by CA Daioglou	Vassilis Daioglou	Copernicus Institute of Sustainable Development	Netherlands
22185	54	22	56	9	Enhancing biofuel target can also offset food security due to raw material competition botj in term of availability and market price	accept, the section will be improved by CA Daioglou	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
27211	54	22	56	9	Why isn't there any discussion on biogas plants using livestock effluents? The paper by Cantrell et al (DOI: 10.1016/j.biortech.2008.02.061) could be a point of departure for references.	accept, the section will be improved by CA Daioglou	Marc Aubinet	University of Liege	Belgium
27351	54	22	56	9	The entire subchapter is not ready for review. The large body of literature is not assessed, the selection of paper is arbitrary and the state-of-knowledge (especially since AR5 and also SRCCL) is not assessed in a manner that is useful for the audience of AR6. Key aspects are missing or need to be strenghtened, in particular: There is a trade-off between restoration/re-afforestation and bioenergy. Key in this context (on what is advantaguous when) is the diffusion factor (substitution factor), see e.g .a study where we look into this facet is 10.1111/gcbb.12626 , another approach are cost-suppy curves of bioenergy, see 10.1088/1748-9326/ab6c2e. The topic coppice also needs some better reference, e.g. on its benefits and environmental costs 10.1111/gcbb.12536. There are many more new papers that provide analyses of these issues, too many to be put in a comment. Thorough revision is indispensable.	partly accept, reviewer has a bias on bioenergy aspects the section will be improved by CA Daioglou	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
28797	54	22	56	9	Bioenergy is a very important topic, so I sugeest more attention to it. Means extend this subheading and convert to a heading. There is low infmoration about it in litrature.	accept, the section will be improved by CA Daioglou and with ch 12	Alireza Yazdani	Shiraz University	Iran
29179	54	22	56	9	This report on sustainabiltiy requirements might be useful "Report from the Commission to the Council and the European Parliament on sustainability requirements for the use of solid and gaseous biomass sources in electricity, heating and cooling SEC(2010) 65 final SEC(2010) 66 final /* COM/2010/0011 final */	accept, the section will be improved by CA Daioglou and coordinated with ch 12	SMAIL KHENNAS	Energy and Climate Change Consultant	United Kingdom (of Great Britain and Northern Ireland)
32885	54	22	56	9	There are companies and research groups working on converting waste to biofuel. These should be included. Examples, Enerkem in Alberta, Canada, that is converting municipal solid waste to biofuel (10 ton per day) using gasification process.	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Cheah Singfoong	Independent consultant, formerly more than 10 years with the National Renewable Energy Laboratory, USA	United States of America

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
35889	54	22	56	9	I question if the bioenergy section (7.5.5.) comprehensively covers the current knowledge of the link between bioenergy and AFOLU. As bioenergy (+BECCS) played such a significant role in the scenarios presented in the IPCC 1.5 degree report of 2018, bioenergy deserves a comprehensive coverage. In view of the policy relevance of the chapter I miss content on biomass resource mobilization opportunities and barriers. Much has been published on that, but see e.g. Smith, C. T., et al. (2017). "Opportunities to encourage mobilization of sustainable bioenergy supply chains." Wiley Interdisciplinary Reviews: Energy and Environment 6(e237); and Bentsen, N. S., et al. (2018). "Agricultural residues for energy - A case study on the influence of resource availability, economy and policy on the use of straw for energy in Denmark and Sweden." Biomass and Bioenergy 108: 278-288.	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Niclas Scott Bentsen	University of Copenhagen, Department of Geosciences and Natural Resource Management	Denmark
16587	54	33	#REF!	####	on bioenergy there are residue based systems, marginal lands based systems and dedicated energy crops plus use of commercial crops and timber. I think energy cros may well be land use change as is marginal land use. You might comment on those	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Bruce McCarl	Texas A & M University	United States of America
29773	54	3			Roy et al. 2014; Add this article to the reference	Noted. Thank you.	RAEHYUN KIM	Institute	Republic of Korea
38087	54	17			guarantee	accept editorial	Craig Jamieson	Straw Innovations Ltd	Philippines
21843	54	18		20	succses story abaout this?	noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
10475	54	22			This section is a critical part of the chapter, but currently it barely is a literature review. What are the conclusions from SR15 and SRCCL on this, what is your assessment of the available land (under different socio-economic scenarios), what are the options and cost of providing biomass for biofuel. Lots of individual figures are flagged but no assessment of their relevance and how they sit in the range of studies (e.g. page 55 lines 10/11; how do the numbers in Figure 7.18 compare with the IAM scenario database range?)	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Andy Reisinger	NZAGRC	New Zealand
37455	54	22			A key question that should be considered is what level of bioenergy deployment could be sustainable, and what factors determine whether bioenergy deployment is sustainable and with positive impacts on the carbon balance	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Michiel Schaeffer	Climate Analytics	Netherlands
17811	54	23		31	There are values that might be checked, for instance: line 26 "... China has announced a target of 20% petroleum substitution by 2017,...". Has this happened?	partly accept we reconsider if we include these demand scenarios	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
38089	54	42			sustainably	accept, editorial	Craig Jamieson	Straw Innovations Ltd	Philippines
3485	54	49			the note is empty	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
38091	54				In the section on bioenergy, it may be worth noting that around 300 million tonnes of rice straw is currently burned in the fields each year for disposal. Unlike most other crops, irrigated rice is grown in flooded conditions, meaning oxygen is not able to get to the soil to allow aerobic degradation of organic matter. Hence, in flooded rice-rice systems, the soil carbon levels can be maintained even if all above ground biomass is removed. (So straw does not need to be returned to the soil - just leaving the roots is sufficient to maintain SOC levels). In recent years, companies such as Sampurn Agri-Ventures in India and Straw Innovations in the Philippines have pioneered biogas production from rice straw. Declaration of interest: I am Director of Straw Innovations Ltd.	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Craig Jamieson	Straw Innovations Ltd	Philippines
35893	55	1	55	1	It states that some amount of biomass residue can be combusted to generate 26 EJ yr-1. 26 EJ of what?	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Niclas Scott Bentsen	University of Copenhagen, Department of Geosciences and Natural Resource Management	Denmark
14823	55	1	55	4	Cost effective technologies are needed for conversion of lignocelulosic biomass to bioethanol.	noted	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
12085	55	2	55	4	Using industry waste from crops and forestry is not an issue. However, according to https://www.nature.com/articles/srep15991, removing too much residue from the forest can have negative consequences. Please clarify if the source of waste is from residue or industry?	thank you for the ref	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
4939	55	6	55	11	Rather than using 'very large' and 'drastic', pls provide specific estimates/data and put those in context of the respective orgina scenarios (from the AR5, SR15 or elsewhere) and their underlying assumptions.	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Patrick Lamers	National Renewable Energy Laboratory	United States of America
17935	55	6	55	11	This could be brought to executive summary	noted, itis indeed taken up in spm	Luke Spajic	University of Adelaide (graduate student researcher), University of Oxford (visiting student researcher)	Australia

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
44643	55	6	55	11	While I share this criticism in general, I think it doesn't pay enough attention to three important aspects. 1) The CDR = (mainly) BECCS formula is correct for AR5 and SR15 scenarios, but it has started to change (by including more non-biomass CDR options), so one should check if numbers and reference points of critiques still hold. 2) Reported SR15 scenarios worked with tighter constraints on biomass and on feedstocks, to my knowledge with higher shares of 'sustainable' feedstock that would not require dedicated areas of additional land (e.g., residues, see https://link.springer.com/article/10.1007/s10584-019-02539-x). 3) Even in AR5, BECCS is not the only driver for bioenergy. If you put tight constraints on CCS, bioenergy will shift to other sectors in many models (see, for example: https://iopscience.iop.org/article/10.1088/1748-9326/aaaa02/meta)	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Oliver Geden	German Institute for International and Security Affairs	Germany
22509	55	7	55	7	If it is perennial crops on marginal lands the effects on biodiversit may be quite small.	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Donald Smith	McGill University	Canada
20657	55	8	55	11	Presenting the full range of land use is not very insightful. The online database of scenarios created for the SR1.5 has results of land use for bionergy across over 200 scenarios consistent with the paris targets. Intersting figures and statistics can be derived from these. Huppmann, D., Rogelj, J., Kriegler, E., Krey, V., & Riahi, K. (2018). A new scenario resource for integrated 1.5° C research. Nature climate change, 8(12), 1027-1030.	partly accept, the section will be improved by CA Daioglou and coordinated with ch 12	Vassilis Daioglou	Copernicus Institute of Sustainable Development	Netherlands
22511	55	15	55	15	If one uses crop residues and bomass crops on marginal lands there may be little effect on food production.	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Donald Smith	McGill University	Canada
4941	55	15	55	19	This needs a more balanced viewpoint as the opposite could also be argued: when implemented in best practice fashion, bioenergy crops (e.g., switchgrass or willows) can help prevent nutrient runoff from existing agricultural land, provide buffer strips for biodiversity or recreational enhancement. This stretch of possible implementation and outcomes was e.g., illustrated in the SRCCL SPM.	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Patrick Lamers	National Renewable Energy Laboratory	United States of America
27985	55	17	55	19	IPCC states, "Large scale energy crop production may also lead to altering ecosystem function at scale, diminishing biodiversity and depleting scarce resources." It also leads to increased air pollution: Jacobson, M.Z., Effects of ethanol (E85) versus gasoline vehicles on cancer and mortality in the United States, Environ. Sci. Technol., 41 (11), 4150-4157, doi:10.1021/es062085v, 2007; Jacobson, M.Z., Review of solutions to global warming, air pollution, and energy security, Energy & Environmental Science, 2, 148-173, doi:10.1039/b809990c, 2009; Ginnebaugh, D.L., J. Liang, and M.Z. Jacobson, Examining the temperature dependence of ethanol (E85) versus gasoline emissions on air pollution with a largely-explicit chemical mechanism, Atmos. Environ., 44, 1192-1199, doi:10.1016/j.atmosenv.2009.12.024, 2010	thank you for the ref	Mark Jacobson	Stanford University	United States of America
28087	55	19	55	19	Checck the second sentence and fix the issue	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Alix Frank Rodrigue Idohou	National University of Agriculture	Benin
20659	55	24	55	26	Why present the results of a single scenario? This is not insightful at all. As mentioned in my previous comment, the SR1.5 database is a treasure trove of information concerning the use of bioenergy.	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Vassilis Daioglou	Copernicus Institute of Sustainable Development	Netherlands
27353	55	27	55	31	the individual points that allow for the conclusion need to be presented/discussed and assessed.	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
32989	55	27	55	31	Very vague. Competiton for land in the context of the many demands (food, fuel, biodiversity, etc.) is the key topic/constraint in future bioenergy potentials and deserves a much more nuanced discussion. There is a bunch of literature dealing with this topic across communities, which should be thoroughly reviewd and cited in an IPCC report.	partly accept, the section will be improved by CA Daioglou and coordinated with ch 12	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
46541	55	27	55	31	Further assessment of tradeoffs from bioenergy required, limited references here. The Kline et al. 2017 was commissioned by the US Department of Energy and as such should not be the primary reference for this discussion. See for example for alternative perspectives on bioenergy: Valcu-Lisman AM, Kling CL, Gassman PW. The Optimality of Using Marginal Land for Bioenergy Crops: Tradeoffs between Food, Fuel, and Environmental Services. Agricultural and Resource Economics Review. 2016;45(2):217-245. Griffiths NA(1), Rau BM(2), Vaché KB(3), et al. Environmental effects of short-rotation woody crops for bioenergy: What is and isn't known. GCB Bioenergy. 11(4):554-572. doi:10.1111/gcbb.12536; Rose A. Graves, Scott M. Pearson, Monica G. Turner. Landscape patterns of bioenergy in a changing climate: implications for crop allocation and land-use competition. Ecological Applications. 2016;26(2):515.	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Rachel Bezner Kerr	Cornell University	United States of America
28089	55	28	55	28	Checck the second sentence and fix the issue	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Alix Frank Rodrigue Idohou	National University of Agriculture	Benin
4943	55	29	55	29	"more thorough" compared to what? Site-specific and bottom-up thinking is a critical feature of implementing best practices. Stylised, top-down models and decision making usually cannot account of this. So what is being compared here - at present it is stating the obvious.	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Patrick Lamers	National Renewable Energy Laboratory	United States of America

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
14825	55	33	55	34	put (before the median estimate	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
37457	55	33	55	34	For this statement on the amount of removals required for a 2 degree limit, could the range across models be given? It would be helpful to make the connection between the amount of bioenergy that could be produced sustainably and the amount of removals needed in different pathways, and what this means for other sectors.	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Michiel Schaeffer	Climate Analytics	Netherlands
27355	55	33	55	39	This para does not belong to the bioenergy section, rather to the afforestation/reforestation assessment	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
32991	55	33	55	39	Unclear why the focus is on afforestation here suddenly again, as the whole section is about bioenergy. The Bastin et al. Study should be discussed in the context of afforestation and not bioenergy.	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
44645	55	33	55	39	Unclear what the point of reference for the 600 Gt is? Which scenarios (and from where: AR5? SR1.5?), what does "with any confidence" mean? Again, better to check against the AR6 scenario database	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Oliver Geden	German Institute for International and Security Affairs	Germany
20661	55	34	55	35	The statement "Using BECCS, this would probably require crops to be planted solely for the purpose of CO2 removal" isi illogical. If it is solely for the purpose of CO2 removal, it isnt BECCS, it is afforestation. BECCS also provides an energy carrier (fuel) which displaces fossil fuels, thus reducing emissions in the energy system. This section has to be clearer and get its definitions right.	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Vassilis Daioglou	Copernicus Institute of Sustainable Development	Netherlands
39709	55	34	55	37	This paragraph again ignores that BECCS must not require large land, see page 55 lines 1-4 in this chapter.	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Uwe Fritsche	IINAS	Germany
18439	55	34	55	38	It is suggested to provide more literatures on land use studies of BECCS to give a whole picture. This is only the result from one reference.	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Chang Shiyan	Tsinghua University	China
25779	55	34	55	38	Sentence doesn't make sense and is too long. Suggest remove reference to US land area and make the point about extra tree cover in a new sentence.	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Helen Hughes	University of Edinburgh	United Kingdom (of Great Britain and Northern Ireland)
12143	55	34	55	39	What kind of crops are presumed here? Only annual crops, perennials or managed forest as well? If forest is included, rotation length might come into considereration when it comes to timing for implementation?	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
13347	55	37	55	37	… although some states…' Sentence doesn't make sense	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Fred Witham	Rolls-Royce	United Kingdom (of Great Britain and Northern Ireland)
22513	55	37	55	37	Remove "although some states that biophysically,"	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Donald Smith	McGill University	Canada
32049	55	37	55	37	check grammar: 'although some states that biophysically'	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
26919	55	38	55	39	It will determine more than the GHG balance, it will determine the net energy balance. Tree plantation in northern latitudes warms the planet, in the tropicsl it cools the planet. Beyond C, tree plantation changes albedo, sensible and latent heat transfer, and BVOC chemistry and thereby cloud characteristics. A good assessment can be found in Scott (2018, Nat. Comm.).	Afforestation will not be covered in this section anymore. However the reviewer raises an important point which should be coordinated with WGI?	Louis Verchot	International Center for Tropical Agriculture	Colombia
38853	55	38	55	39	This sentence doesn't make sense as it is placed or structure. Is this the afforestation related to the Bastin et al. (2019) paper on using BECCS? How does afforestation fit with the crops being planted to reach the 2 deg C goal? Please clarify this phrase or delete.	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Julian Reyes	Personal Capacity	United States of America
41363	55	39	55	39	re "determine very much the net GHG balance": Would be useful if this is defined - both in the chapter and in the report.	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Jan Fuglestvedt	CICERO	Norway
13349	55	33	56	9	It is unclear to me whether this passage is about biofuel or afforestation, and whether it relates to C sequestration or the avoidance of emissions.	This section in the SOD will focus on bioenergy only, and land estimates will be specific for different energy crops. Avoided emissions will be dealt with in cooperation with chapters 3 and 12.	Fred Witham	Rolls-Royce	United Kingdom (of Great Britain and Northern Ireland)
9911	55	38	56	3	I don't understand: afforestation is always a climate benefit, isn't it? At lease when the net balance is computed over more than 20 years. That's my understanding and that's what this very chapter says in an earlier section. Here, the climate benefits of afforestation are questioned, without references to bolster the doubt. Please 1) provide references to support that afforestation has an ambivalent impact on climate and 2) ensure consistency with earlier sections mentioning the large mitigation potential of afforestation.	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Valentin Bellassen	INRAE	France

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
3487	55	1			a space is needed after EJ	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
17813	55	3		3	Add "BioEnergy with Carbon Capture Storage (BECCS)".	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
17815	55	4		4	, if a carefull care is taken, considering comments above (lines 41-47 page 54), and not entering in conflict with CF and Organic Agricuture (OA) goals.	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
21845	55	7			negative impacts on biodiversity and food security ?pls mention the exampel of negatif impact	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
48145	55	8			Ignores albedo impact of eg changing tundra to forest	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Andrew Lockley	Andrew Lockley	United Kingdom (of Great Britain and Northern Ireland)
43293	55	38			given the legitimate scientific criticisms of Bastin et als paper, I would not rely on it here. there are other papers that make similar points that are far less contentious.	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Deborah Lawrence	University of Virginia	United States of America
48147	55	38			Bastin citation discredited and amended. Cite correction and critical responses or remove the citation. Also ignored albedo risk	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Andrew Lockley	Andrew Lockley	United Kingdom (of Great Britain and Northern Ireland)
775	56	34	34	44	Cardinael et al., (2018) conducted a systematic literature review on the conversion of cropland, forest and grassland to agroforestry systems. This paper provided stock change factors and C sequestration rates for biomass and SOC for 8 main types of agroforestry systems in different regions and climate worlwide. It served as the basis to improve the C sequestration potential of agroforestry systems in the 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. This is also probably a very valid reference here concerning the C sequestration rates in the biomass. Cardinael, R., Umulisa, V., Toudert, A., Olivier, A., Bockel, L., Bernoux, M., 2018. Revisiting IPCC Tier 1 coefficients for soil organic and biomass carbon storage in agroforestry systems. Environ. Res. Lett. 13, 1–20. doi:https://doi.org/10.1088/1748-9326/aaeb5f See also: Ogle, S.M., Wakelin, S.J., Buendia, L., McConkey, B., Baldock, J., Akiyama, H., Kishimoto-Mo, A.W., Chirinda, N., Bernoux, M., Bhattacharya, S., Chuersuwan, N., Goheer, M.A.R., Hergoualc'h, K., Ishizuka, S., Lasco, R.D., Pan, X., Pathak, H., Regina, K., Sato, A., Vazquez-Amabile, G., Wang, C., Zheng, X., 2019. Cropland - Chapter 5, in: Volume 4 - Agriculture, Forestry and Other Land Use. 2019 Refinement to the 2006 Guidelines for National Greenhouse Gas Inventories. IPCC, Hayama, Japan. Https://Www.Ipcc-Nggip.Iges.or.Jp/Public/2019rf/Index.Html.	Accepted. The section has included this reference.	Rémi CARDINAEL	CIRAD	France
46369	56	1	56	9	Regarding the sentence "Planting at such scale could involve more release than uptake of greenhouse gases, at least initially, as a result of land clearance, soil disturbance and increased use of fertilizer" there are two good references to support the statement: Brown, I, Castellazzi, M, Feliciano D (2014) Comparing path dependence and spatial targeting of land use in the implementation of climate change responses. Land3(3), 850-873 and Brown (2020). Challenges in delivering climate change policy through land use targets for afforestation and peatland restoration. Environment Science and Policy	noted	Diana Feliciano	University of Aberdeen	United Kingdom (of Great Britain and Northern Ireland)
4945	56	2	56	3	Suggest to delete lines 2-3. I do not follow that land needs to be cleared to plant trees. Either trees/forests exist already and will be replanted (thus no disturbance of the C cycle), or- and ideally - this is linked to afforestation. As such the initial releases for planting will come solely from machinery to transport seedlings and quite frankly in the case of seeding with drones the "fuel consumption" would be marginal. So I think this is dramatizing since - when we assume we need BECCS to reduce C emissions our respective supply chains to grow trees would be "C optimized".	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Patrick Lamers	National Renewable Energy Laboratory	United States of America
10477	56	2	56	9	Please don't just state possibilities, but provide an assessment. Is the IPCC concluding that using biomass for BECCS will result in a net release of CO2 (lines 7/8) or a net removal of CO2 (line 5)? What are your conclusions? There is a plethora of literature out there, including on options to ensure biomass production for biofuels meets a range of sustainability criteria - but I can't see it in this section.	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Andy Reisinger	NZAGRC	New Zealand
32491	56	2	56	9	BECCS is not carbon neutral nor negative, but leaves a carbon deficit for 44 to 104 years (see next comment); moreover, emissions from land-use change to accommodate bioenergy production for BECCS could offset the carbon removed from the atmosphere by BECCS. See Anna B. Harper et al., Land-use emissions play a critical role in land-based mitigation for Paris climate targets, Nature Communications (August 2018) ("Under the modelled land-use and climate scenarios we find that the accumulated carbon removed from the atmosphere through BECCS is largely offset by initial reductions in stored land carbon. Our results suggest a land carbon sink that is twice as strong in the 2 °C scenario compared to 1.5 °C (Fig. 2), irrespective of land use scenario. This is due to both the fertilizing effect of CO2 being larger, and the growth of more high latitude vegetation in the 2 °C scenario. These positive impacts on land carbon of the 2 °C scenario are partially offset by losses of carbon due to higher respiration rates at 2 °C compared to 1.5 °C."). Further, converting planned new natural forests to bioenergy crops for BECCS systems could nearly wipe out the sequestration potential of BECCS. Some estimates expect BECCS to remove about 480 Gt CO2 by 2100. If bioenergy crops replaced planned new natural forests, that sequestration potential may be as low as 11 Gt CO2, delaying the time BECCS becomes carbon negative by decades. Lewis, S. et. al. (April 2019) Regenerate natural forests to store carbon, Nature, pp. 27-28.	accept, thank you for the reference. the section will be improved by CA Daioglou and coordinated with ch 12	Durwood Zaelke	Institute for Governance & Sustainable Development	United States of America

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
32493	56	2	56	9	BECCS is not carbon negative in the near-term because bioenergy leaves a carbon deficit for several decades to a century—far longer than the window of a decade or two available for slowing feedbacks and avoiding crashing through the 1.5C guardrail. See, e.g., IPCC AR5 WG III (2014) 11.13.4 GHG emission estimates of bioenergy production systems ("The combustion of biomass generates gross GHG emissions roughly equivalent to the combustion of fossil fuels. If bioenergy production is to generate a net reduction in emissions, it must do so by offsetting those emissions through increased net carbon uptake of biota and soils…Hence, the total climate forcing of bioenergy depends on feedstock, site-specific climate and ecosystems, management conditions, production pathways, end use, and on the interdependencies with energy and land markets…For example, in the specific case of existing forests that may continue to grow if not used for bioenergy, some studies employing counterfactual baselines show that forest bioenergy systems can temporarily have higher cumulative CO2 emissions than a fossil reference system (for a time period ranging from a few decades up to several centuries"). Subsequent analysis since AR5 further strengthens the case that bioenergy is not carbon neutral in the critical next decade or two. Danielle Venton, Core Concept: Can bioenergy with carbon capture and storage make an impact?, PNAS (2016); Mary S. Booth, Not carbon neutral: Assessing the net emissions impact of residues burned for bioenergy, Environ. Res. Lett. 13 (21 February 2018); Sterman J. D., et al. (2018) Does replacing coal with wood lower CO2 emissions? Dynamic lifecycle analysis of wood bioenergy, Envtl. Research Letters 13(015007):1–10, 1 ("We simulate substitution of wood for coal in power generation, estimating the parameters governing NPP and other fluxes using data for forests in the eastern US and using published estimates for supply chain emissions. Because combustion and processing efficiencies for wood are less than coal, the immediate impact of substituting wood for coal is an increase in atmospheric CO2 relative to coal. The payback time for this carbon debt ranges from 44–104 years after clear-cut, depending on forest type—assuming the land remains forest. Surprisingly, replanting hardwood forests with fast growing pine plantations raises the CO2 impact of wood because the equilibrium carbon density of plantations is lower than natural forests. Further, projected growth in wood harvest for bioenergy would increase atmospheric CO2 for at least a century because new carbon debt continuously exceeds NPP. Assuming biofuels are carbon neutral may worsen irreversible impacts of climate change before benefits accrue. Instead, explicit dynamic models should be used to assess the climate impacts of biofuels."). In addition, the CCS part of BECCS has not been demonstrated at scale or at acceptable cost, nor has it won over the support it would need from the public. See Gregory Nemet et al., Negative emissions—Part 3: Innovation and upscaling, Environ. Res. Lett. (May 2018); European Academies Science Advisory Council, Negative emission technologies: What role in meeting Paris Agreement targets? (Feb 2018) ("CCS plans in Europe have been shelved so that whatever experience is being gained globally is outside Europe. The loss in momentum in implementing CCS technologies not only has serious implications for mitigation pathways, but also one of the most commonly cited NETs [negative emissions technologies] (BECCS) assumes the availability of cost effective 'off-the shelf' CCS, while another (direct air capture) relies on the widespread availability of CO2 storage. At present, economic incentives for deploying CCS are inadequate (whether through the very low carbon price or targeted government support), while those for NET development are lacking."); Andersen & Peters, The Trouble with Negative Emissions, Science (Oct 2016). One study estimates that current rate of increase in CCS is 100 times lower than needed to meet the 2C target. See Haszeldine et al. (April 2018), Negative emissions technologies and carbon capture and storage to achieve the Paris Agreement commitments, Philosophical Transactions of	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Durwood Zaelke	Institute for Governance & Sustainable Development	United States of America
17303	56	6	56	9	Please check: if bioenergy use leads to a net release of CO2 in 2100, this means that this option fails and should not be applied.	accept, the section will be improved by CA Daioglou and coordinated with ch 12	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany
22515	56	9	56	9	The use of members of the phytomicrobiome or microbe-to-plant signal compounds tproduced by then has the potential to make crop production systems more climate change resilient (Baker et al. 2018 - Frontiers in Plant Science doi: 10.3389/fpls.2018.01473).	noted, thank you for the reference	Donald Smith	McGill University	Canada
14827	56	10	56	20	"This term------global report" This sentence is not needed/ or may be written in different way.	Accepted. The section has been re-structured and completely re-written	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
2923	56	13	56	13	Study by Kim et al. 2016 (https://doi.org/10.1016/j.agee.2016.04.011) revealed that overall, agroforestry was estimated to contribute to mitigating 14 t CO2-eq./ha/year at least for the first 14 years after establishment. Averaged across all observations, soil C sequestration rates were about 2 t C/ha/year in youngest stands that gradually diminished with time since stand establishment. In addition, study by Kim et al. 2016 shown that: "net CH4 and N2O emissions from soils under agroforestry remained nearly the same as under agriculture". Above information can be outlined in "Agroforestry" section	Kim et al. is a very relevant study. We selected to cite other similar meta-analysis (e.g., Feliciano et al.)	Yurii Pyrozhenko	IPCC TFI TSU	Japan
12025	56	13	56	13	Please include a definition of "Agroforestry" in the glossary	Agroforestry is defined in the section and is added to the glossary	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
22285	56	13	56	24	The term "agroforestry" s considered as innaprpriate as it is recommended to use "agroecosystem:"" as any ecosystem can be considered as a potential "agrosystem".	Agroforestry is a particular agroecosystem and is defined at the start of the section	Noureddine Benkeblia	The University of the West Indies	Jamaica
22187	56	16	56	16	Placement of a period	Noted. The section has been re-structured and completely re-written	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
32051	56	21	56	21	not sure if 'agrosilvicultural ' should agrosilvocultural	Noted. The section has been re-structured and completely re-written	Laura Cardenas	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
38855	56	26	56	32	This paragraph is terribly written and difficult to understand the scientific content. Please re-write for this to be appropriate for an international scientific assessment.	Noted. The section has been re-structured and completely re-written	Julian Reyes	Personal Capacity	United States of America
14829	56	28	56	28	become should be deleted.	Noted. The section has been re-structured and completely re-written	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
9841	56	28	56	58	Twisted sentence.	Noted. The section has been re-structured and completely re-written	Jeanne Bormann	Ministry of agriculture	Luxembourg

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
6869	56	29	56	30	Citations placed in chronological order? Please check	Noted. The section has been re-structured and completely re-written	Valasia Iakovoglou	International Hellenic University	Greece
6871	56	30	56	32	Please check the size of the letters.	Noted. The section has been re-structured and completely re-written	Valasia Iakovoglou	International Hellenic University	Greece
28301	56	32	56	32	Agroforestry systems harbour climate resilient species and a suite of diverse and adaptable sources of food, as well as fibre and fuel (Sardeshpande and Shackleton 2019).	Noted. The authors thank the reviewer for their point and associated reference. Consideration will be given to its inclusion.	Mallika Sardeshpande	Rhodes University	South Africa
16641	56	34	56	34	it would be worthwhile recognizing that these rates do not hold forecever due to saturationStewart, C. E., Paustian, K., Conant, R. T., Plante, A. F., & Six, J. (2007). Soil carbon saturation: concept, evidence and evaluation. Biogeochemistry, 86(1), 19-31.	Noted, included in section on soil carbon.	Bruce McCarl	Texas A & M University	United States of America
17305	56	34	56	39	Please explain what "improved fallow" represents. Fallow usually only implies agricultural area temporarily not in use and does not necessary include any agroforestry-related measures.	This section has been restructured and there is no longer a mention to improved fallows.	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany
12275	56	34	56	44	Need to be cautious when talking about SOC sequestration rate per year, though referred.	Noted.	Mohammad Ibrahim Khalil	University College Dublin	Ireland
22189	56	38	56	38	Misspelling on "use"	Noted. The section has been re-written	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
36665	56	38	56	38	land sue should be land use	Noted. The section has been re-written	NARESH KUMAR SOORA	Indian Agricultural Research Institute	India
13351	56	38	56	40	This passage doesn't make sense	Accepted. The section has been re-structured and completely re-written	Fred Witham	Rolls-Royce	United Kingdom (of Great Britain and Northern Ireland)
46543	56	13	57	30	Good to see that agroforestry is discussed at length. However, a more extensive assessment of literature, too much reliance on a few references in this section. See for example There are a number of studies that could be assessed for further assessment of evidence of mitigation potential along with other co-benefits. See for example: Aryal, D. R., Gómez-González, R. R., Hernández-Nuriasmú, R., and Morales-Ruiz, D. E. 2019. Carbon stocks and tree diversity in scattered tree silvopastoral systems in Chiapas, Mexico. Agroforestry Systems, 93(1), 213–227. https://doi.org/10.1007/s10457-018-0310-y; Rakotovao, N. H., Alain, A., Josoa, R. R., Stephan, R., Tantely, M. R., & Zafyson, R. (2016). Carbon footprint of smallholder farms in Central Madagascar: The integration of agroecological practices. Journal of Cleaner Production. agr. https://doi.org/10.1016/j.jclepro.2016.10.045; De Stefano, A., and Jacobson, M. G. 2017, Soil carbon sequestration in agroforestry systems: A meta-analysis, Agroforestry Systems, https://doi.org/10.1007/s10457-017-0147-9; Nadège, M. T., et al., 2019. Carbon storage potential of cacao agroforestry systems of different age and management intensity. Climate and Development, 11(7), 543–554. https://doi.org/10.1080/17565529.2018.1456895; Richards, M. B., and V.E. Méndez, 2014, Interactions between carbon sequestration and shade tree diversity in a smallholder coffee cooperative in El Salvador: carbon sequestration and coffee shade-tree Species. Conservation Biology, 28(2), 489–497. https://doi.org/10.1111/cobi.12181; Shi, L., Feng, W., Xu, J., and Y. Kuzyakov, 2018, Agroforestry systems: Meta-analysis of soil carbon stocks, sequestration processes, and future potentials. Land Degradation & Development, 29(11), 3886–3897.https://doi.org/10.1002/ldr.3136	Noted. The authors thank the reviewer for their suggestion and associated references. Major changes are planned for this subsection, including a more thorough review and assessment of mitigation potential and co-benefits.	Rachel Bezner Kerr	Cornell University	United States of America
27357	56	13	58	30	The assessment of mitigation potentials must be accompanied with an assessment of production potentials or yields as well as an assessment of global food security (can AF and SP be placed in all regions, under what circumstances are they sucessful, what are barriers, what is the role for market systems vs. subsistence, etc.) impacts.	Barriers to implementation and co-benefits are now discussed in the revised version.	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
9913	56	34	58	30	The order of magnitudes provided here are irrealistic. You may want to have a look at (Smith, 2014) for a detailed discussion of general reasoning to bound long term soil C sequestration rates (on the example of grassland but the general reasoning is relevant here). To put is simply, even if you start with a rather low soil C stock of 50 tC/ha and you sequester at the rates mentioned here (4-13 tC/ha/yr) you end up with organic soils (wetlands, peatland) within 6-15 years. I think that if agroforestry did that, people would have noticed. More realistically, based on a recent literature review, (Pellerin et al., 2019b) concludes that there is no significant increase in soil carbon in silvopastures and that the increase in soil carbon when agroforestry is implemented on cropland amounts to an average 0.25 tC ha-1 yr-1 [IC 95% : 0.09-0.39]. When C sequestration in biomass is added together with lower input use on the land are where crops are replaced by trees and substitution of carbon-intensive enery and materials by the additional wood produced, the total climate benefits amount to an average 4.64 tCO2e ha-1 yr-1 (IC 95% : [2.32 ; 8.03]).	Please clarify the citation to Pellerin so that it can be considered in the ecosystem of other available evidence.	Valentin Bellassen	INRAE	France
43963	56		58		Species compositions in these interesting tables and systems would be relevant, certainly building on regional considerations.	The section has been re-structured and re-written.	Hans Poertner and Elvira Poloczanska	Alfred-Wegener-Institut	Germany
16591	56	34	#REF!	####	it would be worthwhile recognizing that these rates do not hold forecever due to saturationStewart, C. E., Paustian, K., Conant, R. T., Plante, A. F., & Six, J. (2007). Soil carbon saturation: concept, evidence and evaluation. Biogeochemistry, 86(1), 19-31.	Same as 16641	Bruce McCarl	Texas A & M University	United States of America
21847	56	2			GHGs	Noted. The section has been re-written	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
10479	56	13			Similar comments apply here as for conservation agriculture: please clarify to what extent this is simply a combination of mitigation options already covered individually, and what is its potential and cost? Also e.g. on page 56 line 35, are you saying that all silvopastoral systems have such high rates of soil C sequestration? For how long?	Noted. Extensive revision of this subsection is planned. The reviewer's points will be taken into consideration during revision.	Andy Reisinger	NZAGRC	New Zealand
3491	56	19			The second "this" is in excess	Noted. The section has been re-written	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
769	56	22			"silvopastoral" instead of "silvopastorial"	Noted. The section has been re-written	Rémi CARDINAEL	CIRAD	France
21849	56	24			how about ICRAF definition of agroforestry?thare are some research result was conducted by ICRAF better if can be cited	Agroforestry has now been defined.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
29585	56	24			FAO 2017; Add this article to the reference	Please clarify the reference so that it can be considered in addition to other information	RAEHYUN KIM	Institute	Republic of Korea
3493	56	28			it (erased become) is	Noted. The section has been re-written	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
6867	56	28			Please check "it become is the second…"	Noted. The section has been re-written	Valasia Iakovoglou	International Hellenic University	Greece
48149	56	28			"best" is not defined and is contested. Cheapest? Highest capacity? Most benign?	Noted. The section has been re-written	Andrew Lockley	Andrew Lockley	United Kingdom (of Great Britain and Northern Ireland)
29733	56	29			Newaj et al. 2016; Add this article to the reference	Please clarify the reference so that it can be considered in addition to other information	RAEHYUN KIM	Institute	Republic of Korea
29717	56	30			Mbow et al. 2014; Add this article to the reference	Please clarify the reference so that it can be considered in addition to other information	RAEHYUN KIM	Institute	Republic of Korea
17817	56	34		44	In this paragraph are used tC ha-1 yr-1 and Mg ha-1 yr-1. Be consistent with the units as mentioned in above cooments.	Noted. The section has been re-written	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
29597	56	36			Feliciano et al. 2017; Add this article to the reference	Included	RAEHYUN KIM	Institute	Republic of Korea
46889	56	36			Feliciano et al., 2017: reference missing	Included	Martin Schönhart	University of Natural Resources and Life Sciences, Vienna	Austria
17819	56	38		38	"... Land use", not land sue	Noted. The section has been re-written	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
3495	56	38			use instead of sue	Noted. The section has been re-written	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
6873	56	38			Please correct "land sue" to "land use"	Noted. The section has been re-written	Valasia Iakovoglou	International Hellenic University	Greece
14831	56	38			land sue tyo be replaced by land use	Noted. The section has been re-written	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
46195	57	1	57	4	Figure 7.19. Units missing in the X axis	Noted. The section has been re-written	Daniel Ortiz-Gonzalo	Department of Geosciences and Natural Resource Management, Faculty of Science, University of Copenhagen	Denmark
773	57	4	57	4	The title of the Figure 7.19 should be modified as follows: "Mean absolute change in above ground carbon and soil organic carbon sequestration..." instead of "Mean absolute change in above ground carbon and below ground carbon sequestration..."	Noted. The section has been re-written	Rémi CARDINAEL	CIRAD	France
27213	57	4	57	5	Specify axes units and error bar meaning in figures.	Noted. The section has been re-written	Marc Aubinet	University of Liege	Belgium
771	57	6	57	10	Cardinael et al., (2018) conducted a systematic literature review on the conversion of cropland, forest and grassland to agroforestry systems. This paper provided stock change factors and C sequestration rates in biomass and soils for 8 main types of agroforestry systems in different regions and climate worlwide. It served as the basis to improve the C sequestration potential of agroforestry systems in the 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. The authors found that the mean SOC storage rate (± confidence intervals) for croplands converted to agroforestry systems was 0.75 ± 0.19 t C ha−1 yr−1. This is probably a very valid reference to also mention here. Cardinael, R., Umulisa, V., Toudert, A., Olivier, A., Bockel, L., Bernoux, M., 2018. Revisiting IPCC Tier 1 coefficients for soil organic and biomass carbon storage in agroforestry systems. Environ. Res. Lett. 13, 1–20. doi:https://doi.org/10.1088/1748-9326/aaeb5f	Included in the revised version	Rémi CARDINAEL	CIRAD	France

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
10593	57	29	57	29	"As illustrated in section XXX",'XXX' needs specification.	Noted. This section has been rewritten	Wen Zhang	Institute of Atmospheric Physics, Chinese Academy of Sciences	China
36667	57		57		The x axis units are mssing	Noted. This section has been rewritten	NARESH KUMAR SOORA	Indian Agricultural Research Institute	India
17821	57	1		5	There are missing units in x-axis	Noted. This section has been rewritten	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
3497	57	1			in figure 7.19 : what is the metric in abscissa?	Noted. This section has been rewritten	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
3499	57	1			please to set that n= number of observations	Noted. This section has been rewritten	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
3501	57	1			De Stefano and Jacobson (2018) noted…	accept, editorial	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
29571	57	6			De Stefano and Jacobson 2018; Add this article to the reference	accept, editorial	RAEHYUN KIM	Institute	Republic of Korea
46891	57	6			de Stefanon and Jacobson, 2018: reference missing	accept, editorial	Martin Schönhart	University of Natural Resources and Life Sciences, Vienna	Austria
3489	57	34			bracket alone	Noted. This section has been rewritten	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
17307	58	1	58	11	Figures 20 and 21: Please provide information whether the tropical studies separately shown in figure 21 are also included in figure 20 and consider placing the different systems in the same order in each panel to facilitate comparisons	Noted. This section has been rewritten	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany
27215	58	12	58	14	This sentence is clearly overstated. Agroforestery is not able to reverse the atmospheric CO2 increase alone. The numbers given at the end of the paragraph (20.2-46.7 Pg on 30 years) suggests its impact to not exceed 5 % of global emission	Noted. This section has been rewritten	Marc Aubinet	University of Liege	Belgium
27217	58	12	58	30	Pg of CO2; Mg C ha-1; Pg C, tC ha-1, Mg ha-1 the use of different units makes any comparison difficult. Use ocherent units	Noted. This section has been rewritten	Marc Aubinet	University of Liege	Belgium
25781	58	18	58	20	Suggest this reference is made either above the Feliciano (2017) discussion or not at all? The Lorenz and Lal paper is earlier than Feliciano and, placed here, seems to somewhat negate the discussion above.	Noted. This section has been rewritten	Helen Hughes	University of Edinburgh	United Kingdom (of Great Britain and Northern Ireland)
32123	58	28	58	30	In this section on "Agroforestry systems", we need more references Perennial based agroforestry system. In line 28 to 30 of page 58, for cocoa agroforest, please also consider other references with their values. For example, you can consider the following references: Sonwa D.J., Weise S.F., Nkongmeneck B.A., Tchatat M., Janssens M.J.J. (2017) Profiling Carbon Storage/Stocks of Cocoa Agroforests in the Forest Landscape of Southern Cameroon. In: Dagar J., Tewari V. (eds) Agroforestry. Springer, Singapore https://link.springer.com/chapter/10.1007/978-981-10-7650-3_30	Noted. This section has been rewritten	Denis Jean Sonwa	CIFOR (Center for International Forestry Reseacrh)	Cameroon
36669	58		58		Fig 7.20, & 7.21 the y axis should be corrected with spaces (from Cha to C ha)	Noted. This section has been rewritten	NARESH KUMAR SOORA	Indian Agricultural Research Institute	India
3503	58	1		11	C ha needs a space between C and ha in ordinates of tables 7.20 and 7.21	Noted. This section has been rewritten	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
17823	58	12		13	"... Can slow or even reverse the increase..." This is at global scale or at local Balance? At what pace? For sure it will mitigate bu reverse just by agroforestry is unlikely. Many other things to happen at the same time, not just driven by agroforestry.	Noted. This section has been rewritten	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
17825	58	26		30	In this paragraph are used tC ha-1 yr-1 and Mg ha-1 yr-1. Be consistent with the units as mentioned in above cooments.	Noted. This section has been rewritten	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
29799	58	27			Temgoua et al. 2018; Add this article to the reference	Please clarify the reference so that we can evaluate it in light of other evidence.	RAEHYUN KIM	Institute	Republic of Korea
3505	58	29			t instead of Mg, with a space between Mg and ha-1	Noted. This section has been rewritten	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
29789	58	30			Somarriba et al. 2013; Add this article to the reference	Please clarify the reference so that we can evaluate it in light of other evidence.	RAEHYUN KIM	Institute	Republic of Korea

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
42437	58	30			Please add either a box item or in the running text after line 30: Enhancing the carbon sink through Trees outside Forests (TOF) in India Trees outside forests (TOFs), in India are defined as trees growing outside Government recorded forest areas (RFAs). They play a major role towards the rural economy, food security and biodiversity, as well as to the country's forest cover, growing stock, and carbon sequestration. Currently, TOFs contribute to one-fourth of the country's total growing stock of wood and, substantially to the country's timber production. The potential timber production from TOFs fulfill 45% of total timber demand in India compared to the timber production from RFAs that caters to only 3.35% of total timber demand (Ghosh and Sinha, 2016). TOFs have the potential to alleviate pressure on forest areas, by being a useful timber resource of the country (Chakravarty et al., 2019). The C-sequestration potential of TOFs is also enormous (Chakravarty et al., 2019) and can be utilized in meeting the commitments as specified under NDC. With reference to the country's NDC, an additional carbon sink of 2.5–3 billion tones of CO2 equivalent is to be created by 2030, and in this context, the potential of TOFs is highly regarded. The Green India Mission should recognize the arena of agroforestry and social forestry to increase biomass stock and carbon sequestration. Additionally, it is suggested that a nationwide strategy for developing an umbrella policy and a network of market to realize the complete potential of TOFs as an important resource for timber production and carbon sequestration be made. There is an absence of a uniform nationwide policy for management of TOFs, and the regulations for managing TOFs in the states of India vary in terms of institutional mechanisms (permit for felling and transit) along with market accessibility. For a holistic development of TOFs and agroforestry in India, integrating with other current rural development programs can increase the adoption of TOFs. Further, there is a lack of reliability and consistency in some of the available data and information dealing with the growing stock, consumption and production of timber, from both forest areas and TOFs, which constrains the forecast of supply and demand projections. Strengthening and building capacities of the organizations and officials related to the monitoring and evaluation of forests and TOFs with respect to productivity is another key concern that the government needs to address. The need for valid record and consistent data keeping with respect to timber production and C-sequestration potential of both forests and TOFs is also important for effectively monitoring the implementation of any policies/ acts/ regulations. A uniform and simplified policy for management of TOFs, along with developed market linkages, can boost tree growing on private lands, thus increasing timber production. Further, linking TOF management with programmes like REDD+ can create an additional sink for carbon which would also help the country in meeting its international commitments and provide additional financial incentives. Programmes such as REDD+, which incentivizes the right stakeholders and organizations responsible for enhancing the carbon stock through avoiding deforestation, degradation and sustainable forest management, should be implemented to encourage adoption of trees outside forests (Ghosh and Sinha, 2018 a & b).The existing institutional framework related to TOFs should be revisited and modified in order to promote TOFs for enhancing income and contributing to mitigation of climate change. Ref:	The section follows the same format as other mitigate measures and thus can not include a box. We will evaluate Chakravaty (2019) for inclusion.	Bhaskar Sinha	Indian Institute of Forest Management	India
36671	58	58			fig 7.21 b the values for soil C in boundary plamtings is missing	Noted. This will be revised.	NARESH KUMAR SOORA	Indian Agricultural Research Institute	India
1497	59	1	59	15	same comment as above	Unfortunately, due to reordering of comments, it is unclear what the reviewer refers to.	JUNGUO LIU	Southern University of Science and Technology	China
9843	59	1	59	15	Compare relative benefits between SRI rice production and rice-fish farming systems.	Noted. The authors thank the reviewer for their suggestion which will be considered during revision of the section.	Jeanne Bormann	Ministry of agriculture	Luxembourg
22191	59	1	59	15	However, when an integrated rice-fish system is applied, cautions must be applied, mainly the use of chemical pesticide and and the excessive fertilization.	Noted. This subsection will be extensively revised. However, the authors point will be taken into consideration.	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
46545	59	1	59	15	Good to see that crop-livestock integration is considered, but more extensive assessment of literature needed in this section, both in terms of mitigation potential and co-benefits.	Noted. This subsection will be extensively revised. A more comprehensive, though concise, assessment of integrated production systems is planned.	Rachel Bezner Kerr	Cornell University	United States of America
46893	59	1	59	15	There seems to be some overlap between the arguments in this chapter an in the section on integrated production systems (p48)	Noted. Both subsections on integrated production will be merged and extensively revised.	Martin Schönhart	University of Natural Resources and Life Sciences, Vienna	Austria

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
20665	59	2	59	15	This section can go a bit deeper into the constraints that limit further adoption of integrated systems, even when policies promoting their adoption exists. Surveys with farmers in cetnral Brazil (which have access to crdit lines for the adoption of integrated systems) highlighted a number of limiting factors including the need of trained labour, infrastructure for multiple outputs, percieved additional costs, and traditional farming/ranching methods. Furthermore, this section does not make clear that integrated systems may offer productivity gains, resilience to climate change (increased adaptive capacity), as well as reduced environmental impacts, as highlighted by farm system models. In this sense the adoption of integrated systems could lead to massive reduction in land demand and thus allow for carbon sequestration through the reforestation of extensive pasture lands. Gil, J., Siebold, M., & Berger, T. (2015). Adoption and development of integrated crop–livestock–forestry systems in Mato Grosso, Brazil. Agriculture, Ecosystems & Environment, 199, 394-406. Gil, J. D. B., Garrett, R., & Berger, T. (2016). Determinants of crop-livestock integration in Brazil: Evidence from the household and regional levels. Land Use Policy, 59, 557-568. Gil, J. D., Garrett, R. D., Rotz, A., Daioglou, V., Valentim, J., Pires, G. F., ... & Reis, J. C. (2018). Tradeoffs in the quest for climate smart agricultural intensification in Mato Grosso, Brazil. Environmental Research Letters, 13(6), 064025	Noted. It is planned to extensively revise this subsection. A more comprehensive assessment will be provided, though will be constrained somewhat by word count. It is planned to include brief discussion on co-benefits and trade-offs - as space allows. The authors thank the reviewer for information on Brazil and associated references.	Vassilis Daioglou	Copernicus Institute of Sustainable Development	Netherlands
25783	59	2	59	15	This section (currently) doesn't add anything on top of what has been said previously. It should be expanded or removed.	Accepted. This subsection will be extensively revised as part of wider planned changes to the entire section.	Helen Hughes	University of Edinburgh	United Kingdom (of Great Britain and Northern Ireland)
14835	59	9	59	15	There are reports of high methane emissions from rice fish systems. Ref: Datta, Arindam & Nayak, Dalirani & Sinhababu, D.P. & Adhya, Tapan. (2009). Methane and nitrous oxide emissions from an integrated rainfed rice–fish farming system of Eastern India. Agriculture, Ecosystems & Environment. 129. 228-237. 10.1016/j.agee.2008.09.003.	Noted. The authors thank the reviewer for the suggested reference, which will be considered during revisions of the subsection.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
2921	59	13	59	14	Indeed, the movement of fish helps turn over and loosen the soil, promoting fertilizer decomposition and root development. However, even despite of this fact, reduction of emissions from fertilizer application will be partially offset by increase of e.g. CH4 emissions due to decomposition of organic matter (fish manure) in anaerobic conditions.	Noted. Extensive revisions are planned for this subsection. However the reviewer's point will be taken into consideration during the process.	Yurii Pyrozhenko	IPCC TFI TSU	Japan
41383	59	18	59	18	Once amendeded to soils, biochar may move in the environment through various processes e.g. runoff, erosion, bioturbation. This is not recognised in section 7.5.8, but has shown to be significant in several cases, e.g Haefele 2011 doi:10.1016/J.FCR.2011.01.014, Sing 2015 doi: 10.1371/journal.pone.0141560, Major 2010 doi: 10.1007/s11104-010-0327-0, Kätterer 2019 doi:10.1016/j.fcr.2019.02.015, and considered of importance in a recent review from Tisserant and Cherubini 2019 doi:10.3390/land8120179.	Accepted. Movement through the environment has been added.	Cecilia Sundberg	Swedish University of Agricultural Sciences	Sweden
32887	59	20	59	24	Actually biochar can be produced from gasification also, though the yield is lower. Example: Hansen et al. Biomass and Bioenergy, Vol 72, p300-308, January 2015.	Accepted Gasification added	Cheah Singfoong	Independent consultant, formerly more than 10 years with the National Renewable Energy Laboratory, USA	United States of America
42699	59	20	59	24	References required for biochar definition	Accept. Reference added	Eromose Ebhuoma	University of South Africa	South Africa
42949	59	20	59	33	Please note that pyrolysis is only one type of process to produce biochars, therefore the information provided here is not fully correct.	Accepted Gasification added	Sigrid Kusch-Brandt	University of Padua	Germany
6875	59	21	59	24	I would suggest adding reference(s).	Accept Reference added	Valasia Iakovoglou	International Hellenic University	Greece
35297	59	24	59	24	At the end of the last sentence, you can cite our study (Kajiura et al., 2015) which showed the sinificant role of oxygen and tempetaure condition on the formation and degradability of biochar. Ref: Kajiura, M., Wagai, R., Hayashi, K. (2015). "Optimal Thermolysis Conditions for Soil Carbon Storage on Plant Residue Burning: Modeling the Trade-Off between Thermal Decomposition and Subsequent Biodegradation." J Environ Qual 44(1): 228-235.	Accept. Reference added	Rota Wagai	National Agriculture and Food Research Organization, Institute for Agro-Environmental Sciences, Division of Climate Change	Japan
41375	59	26	59	28	The cited papers do not explain why 450C is chosen as the temperature threshold. While there is clear evidence of higher stability at higher temperature, it is not obvious where to draw the line. Since the 450C limit published by IPCC in 2019 (in its revised inventory guidelines) is already influencing policy and biochar standard development, it is impportant that the temperature is chosen based on a detailed literature review. For instance, Budai 2016 identified a threshold at "as low as" 370C for miscanthus and corncob, doi: 10.1007/s00374-016-1116-6. See also the work from Fang 2015 (reporting a continuous stability increase with pyrolysis temperature), Wang 2016 and Whitman 2013 (both reporting a threshold).	Partly accepted. "approximately" symbol added. Insufficient space to explain these details. Fang already cited. Budai added.	Cecilia Sundberg	Swedish University of Agricultural Sciences	Sweden
41385	59	29	59	30	The sentence explains that biochar mineralisation in soils is affectedby soil properties (or processes) e.g. minerals and native organic matter. The sentence could also mention other interventions (soil management) affecting stability e.g. transient increased/decreased biochar decomposition when amending a biochar containing soil with other organic amendments, see section 3.5 in Zimmerman and Ouyang 2019 doi:10.1016/j.soilbio.2018.12.011	Accepted, mention of impact of DOM added, Zimmerman and Ouyang reference added.	Cecilia Sundberg	Swedish University of Agricultural Sciences	Sweden

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
32889	59	29	59	33	Biochar stability is also significantly influenced by the method it is produced. With gasification the biochar produced has more aromatic rings per cluster and is more resistant to breakdown, see e.g., Brewer et al., Env Progress & Sustainable Energy, Vol 28, Issue 3, p386-396, 2009	Noted. The key difference between pyrolysis and gasification is the reaction temperature, and the influence of temperature is already described.	Cheah Singfoong	Independent consultant, formerly more than 10 years with the National Renewable Energy Laboratory, USA	United States of America
1025	59	40	59	47	Reports of decreased emissions of N2O resulting from biochar additions are cited. However, these are mainly laboratory experiments showing decreases in the short-term. It seems unwise to extrapolate from these data.	Noted. The meta-analyses cited include field observations as well as laboratory and pot trials. The wide range in results is emphasised.	David Powlson	Rothamsted Research	United Kingdom (of Great Britain and Northern Ireland)
22517	59	45	59	45	Change "with" to "with an"	Accepted	Donald Smith	McGill University	Canada
8573	59	47	59	50	There was a study about reduction of methane emissions from rice paddy by applying biochar in Korea. So, I ask for including the results into this report. Reference: Combined application of biochar and slow-release fertilizer reduces methane emission but enhances rice yield by different mechanisms(Kim et al., 2017).	Accepted, reference added	Eun Jung Choi	National institute of agricultural sciences	Republic of Korea
22193	59	18	60	17	Biochar production also aims at reducing fire fuel in the field, which is also decreasing the risk of wild fires, giving alternative source of soil nutrient, and to some extent giving additional Income to farmers.	Accepted, Wildfire management added	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
27987	59	18	60	17	The discussion of biochar ignores entirely the air pollution and its corresponding social cost. Please discuss the air pollution health effects of using biochar.	Accepted. Risk of methane and particulate emissions has been added	Mark Jacobson	Stanford University	United States of America
44647	59	18	60	17	This is a very informative section, with a very positive message. But that leads to question: why isn't biochar already a major part of national mitigation policies? It might be costs, it might be political barriers, it might be farmers' ignorance. Again, maybe 7.5 is not the subchapter to deal with constraints, but biochar is not being dealt with in 7.7	Accepted. Barriers to adoption have been added.	Oliver Geden	German Institute for International and Security Affairs	Germany
14833	59	5			emissions from should be replaced by emissions of	Noted. This sentence will be changed.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
21851	59	7			FAO, 2015	Noted. Thank you.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
29581	59	7			FAO 2015; Add this article to the reference	Noted. Thank you.	RAEHYUN KIM	Institute	Republic of Korea
3507	59	10			Refs are missing	Noted. All references will be checked.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
3509	59	14		15	it is not "data from these systems have been mixed" but "the results from these rice-fish systems are mixed (Hu etc.)	Noted. This sentence will be changed.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
3511	59	36			via adsorption of labile C on biochar surfaces	Accepted	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
20179	59	46		47	Out of place?	Issue not clear.	Henry Neufeldt	UNEP DTU Partnership	Denmark
29665	59	52			Jeffrey et al. 2017; Add this article to the reference	Noted. The reference is included but the author's name was misspelled at line 52, now corrected.	RAEHYUN KIM	Institute	Republic of Korea
32495	60	5	60	17	Note importance of smaller scale biochar as well. According to Smith P. (2016), Soil Carbon Sequestration and Biochar as Negative Emission Technologies, less than a hectare of biochar-treated land may be able to draw down approximately a ton of carbon annually.	Noted. Drawdown is determined by the amount of biochar produced, not the area to which it is applied. The mitigation value per tonne of feedstock is included, which shows the potential at any scale, including small scale.	Durwood Zaelke	Institute for Governance & Sustainable Development	United States of America
41377	60	8	60	10	This is not the most recent information on this topic. It is better to cite a recent review of 34 biochar LCAs, section 9 in Tisserant and Cherubini 2019 doi:10.3390/land8120179. Life cycle emissions range from near zero to about -1.5 t CO2eq/t feedstock (Figure 3).	Noted. Tisserant and Cherubini estimates have been added.	Cecilia Sundberg	Swedish University of Agricultural Sciences	Sweden
32893	60	8	60	17	Are all these values obtained after taking account of CO2 that is emitted during pyrolysis and gasification? In biofuel synthesis, the carbon released will be used in synthesis, so there is no "extra" emission. However, if abiochar manufacturers is only intending to make biochar as the lone product, there will be extra CO2 emitted that needs to be accounted for.	Noted. Life cycle climate change impacts, provided in the cited studies, include supply chain emissions and net biogenic C flux .	Cheah Singfoong	Independent consultant, formerly more than 10 years with the National Renewable Energy Laboratory, USA	United States of America

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
41387	60	10	60	12	Whether biochar systems can deliver greater benefits than bioenergy is also dependent on what energy the bioenergy replaces. In energy systems with GHG-intensive energy carriers like coal, bioenergy is a relatively better option. This is mentioned in Woolf et al 2010 and ought to be highlighted in this sentence. Azzi 2019 doi:10.1021/acs.est.9b01615 analyses the trade-off between biochar and bioenergy in under different energy system assumptions, in a context where no agricultural productivy gains are obtained but agricultural GHG emission reduction are achieved.	Accepted. This point, and Azzi reference has been added.	Cecilia Sundberg	Swedish University of Agricultural Sciences	Sweden
41389	60	12	60	17	Biochar production potentials were recently reviewed by Tisserant and Cherubini 2019 doi:10.3390/land8120179, including deployment timeframe considerations.	Noted. Tisserant and Cherubini estimates have been added.	Cecilia Sundberg	Swedish University of Agricultural Sciences	Sweden
41795	60	14	60	14	3.7 - 6.6 Gt CO 2e yr - 1 (including 2.6 -4.6 GtCO 2e yr - 1	Noted. This text has been reworded	Cecile Girardin	University of Oxford	United Kingdom (of Great Britain and Northern Ireland)
14837	60	15	60	15	There may be emissions during the process of pyrolysis which need to be accounted	Noted. Life cycle climate change impacts, as provided in the cited studies, include supply chain emissions.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
32891	60	15	60	16	Should convert the 240-475 Gt CO2e per century value from Woolf et al. to per annum basis to be more easily compared with the other values cited in this paragraph. Otherwise someone trying to read quickly will be confused by the large values (240-475) compared to the other values presented (all less than 10).	Noted. The per annum value is also provided.	Cheah Singfoong	Independent consultant, formerly more than 10 years with the National Renewable Energy Laboratory, USA	United States of America
22195	60	19	61	27	However, production processes of wood products can also offset the GHG reduction taarget if the process (at undustrial scale) still use fossil fuel. Therefore, it is important to incourage industries involved in wood product industry to shift to bio fuels	noted, we will consider the suggestions	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
46895	60	19	61	27	There are overlaps with the chapter "improved wood utilization" on p44.	accept, editorial	Martin Schönhart	University of Natural Resources and Life Sciences, Vienna	Austria
604	60	21	61	27	Text repeated from P. 44	accept, editorial	Pierre Bernier	Natural Resources Canada	Canada
27359	60	21	61	27	10.1088/1748-9326/ab0fe3 should be included, it contains material that relates to the subchapter and gives some important caveats as well. A key point is that is currently missing is that there are two effects: hwp represent a stock - if this is associated with a positive climate effect depends on the losses that occur during harvest and processing (only a fraction of the wood-carbon ends up in buildings) as well as on the turnover rate of e.g. buildings. The net-effect might thus be small, given the short turnover times of buildings and the long turnvoer times of forests. Second, the substituion effect of energy(emission) intensive products: this certainly depends on the level of (de)carbonisation of the steel-cement industry. In a close-to-decarbonized system, the substitution effect might be small. And a last point: the scale effect. The supply potential for wood on large-scales to replace cement and steel is key - forest are a scarce resource, as only increment should be used (sustainable forestry) - and the system effects on C-stocks (steady-state) are important to factor in (AR5 pg841, for instance).	noted, we will consider the suggestions	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
25785	60	33	61	3	Repetition from p44, line 26. p61 line 23 is also repeated?	accept, editorial	Helen Hughes	University of Edinburgh	United Kingdom (of Great Britain and Northern Ireland)
38643	60	33	61	27	Most of the information relating to HWP in section 7.5.9 just repeats the information in the sub-section of "improved wood utilization in section 7.5.1 in page 44. Please differentiate the information on HWP or just refer what previous section said in this section, as there is little merit to read the exactly same information twice in this chapter	accept, quantification section will be rewritten	Atsushi Sato	Mitsubishi UFJ Research and Consulting Co.,Ltd.	Japan
32125	60	19	62	9	In this section on “Demand-side measures”, we are lacking the measure related to some crops such as cocoa and oil palm that are threatening the tropical forest. European countries for example are now thinking on how to reduce what they consider as “Imported Deforestation”. Have a look on the following links (https://www.ecologique-solidaire.gouv.fr/sites/default/files/2018.11.14_dp_sndi_mtes.pdf ; https://partnershipsforforests.com/partnerships-projects/the-amsterdam-declarations/)	noted, we will consider the suggestions	Denis Jean Sonwa	CIFOR (Center for International Forestry Reseacrh)	Cameroon
18169	60	19	63	9	Needs further corroboration. Parts even fall short of the discussions already present in ch11 in AR5, WGIII, e.g. the discussion on the conditions for HWP to contribute (or not) to CC-mitigation. There are literatally hundreds if not thousands of studies covering the issues discussed here based on a handfull of references. A substantial effort is required to bring that up to IPCC standards, but at least there is a largely useful storyline and structure	noted, we will consider the suggestions	Helmut Haberl	Institute of Social Ecology, University of Natural Resources and Life Sciences, Vienna	Austria
18173	60	5		17	CO2eq instead of CO2e	accept, editorial	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
35141	60	11			Delete space between Gt CO2eyr-1== GtCO2eyr-1	accept, editorial	Happiness Nnko	The University of Dodoma	United Republic of Tanzania

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
3513	60	16			precise that the offset is for one year	Noted. The text has been revised and now excludes this sentence, but the time frame has been clarified in the revised text.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
35143	60	16			Delete space between Gt CO2eyr-1== GtCO2eyr-1	accept, editorial	Happiness Nnko	The University of Dodoma	United Republic of Tanzania
47681	60	19			7.5.9 – Harvested wood products. It is the change in total stock that maters for direct CO2 sequestration and the substitution of more energy intensive products – need to consider permanence of sequestered carbon.	noted, we will consider the suggestions	raphael Slade	Imperial College	United Kingdom (of Great Britain and Northern Ireland)
21853	60	21			Harvested wood products ? It is sub title?bold?	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
37459	60	21			This section repeats the earlier HWP section	Editorial. Copyedit to be completed prior publication.	Michiel Schaeffer	Climate Analytics	Netherlands
3515	60	24			73,21, and 6% C of what?	accept editorial	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
29721	60	26			Miner and Graudreault, 2016; Add this article to the reference	Editorial. Copyedit to be completed prior publication.	RAEHYUN KIM	Institute	Republic of Korea
29715	60	31			Marchi et al. 2018; Add this article to the reference	Editorial. Copyedit to be completed prior publication.	RAEHYUN KIM	Institute	Republic of Korea
19811	61	5	61	5	Another example could be: Braun M. et al. 2016:A holistic assessment of greenhouse gas dynamics from forests to the effects of wood products use in Austria. Carbon Management Volume 7, 2016 - Issue 5-6	accept editorial	Michael Englisch	Austrian Research Centre for Forests	Austria
9939	61	5	61	16	This paragraph and figure clearly do not include the forest where wood is harvested in the system boundaries of the LCA. If they were, carbon storage would decrease in the first years/decades as tree roots & branches are left to decay in the forest instead of staying alive if wood hadn't been harvested for engineering use. This omission leads to erroneous conclusions on the overall merit of the scenario (Bellassen and Luyssaert, 2014).	reject, we consider the whole balance. but the sections treat various parts	Valentin Bellassen	INRAE	France
10543	61	14	61	15	from Kayo and Noda (2018)?	Editorial. Copyedit to be completed prior publication.	Hiroko Akiyama	National Agriculture and Food Research Organization	Japan
17309	61	17	61	27	Here, references are missing to an already existing system of robust safeguards: it is called sustainable forest management.	noted, we will consider the suggestions	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany
13353	61	23	61	23	Missing superscript on m3	Editorial. Copyedit to be completed prior publication.	Fred Witham	Rolls-Royce	United Kingdom (of Great Britain and Northern Ireland)
38947	61	29	61	29	It appears that thisis the first time that "food systems'' is mentioned as a term. Obviouisly, within a chapter that is concerned about AFOLU, this is quite a different thing, and its definitions and differences between the two should be clearly provided. Please cite the recent paper by Rosenzweig et al. (2020) in Nature Food on this topic.	noted, glossary (this section has been re-structured and the text to which the reviewer refers no longer exists)	francesco tubiello	FAO	Italy
32993	61	29	61	37	Another study that results should be reported here: Alexander, P., Reddy, A., Brown, C., Henry, R.C., Rounsevell, M.D.A., 2019. Transforming agricultural land use through marginal gains in the food system. Glob. Environ. Chang. 57, 101932. https://doi.org/10.1016/J.GLOENVCHA.2019.101932	Rejected. The text to which the reviewer refers no longer exists	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
19241	61	31	61	31	The text refers to intensification of agriculture as source of emissions, but fails to mention the mitigation potential of sustainable intensification (this is mentioned in the diet shift section, but it is relevant beyond diet shifts). Overall intensification of agricultural systems holds more mitigation potential than extensification. There is ample literature on the mitigation potential of intensification, in particular in the livestock sector and related GHG gains (for many: Roe et al. 2019, Contribution of the land sector to a 1.5 °C world, Nature Climate Change; Herrero et al, 2016, Greenhouse gas mitigation potentials in the livestock sector, Nature Climate Change; Alves et al. 2017, Integrated crop–livestock–forestry systems: prospects for a sustainable agricultural intensification, Nutrient Cycling in Agroecosystems) and the risks (spatial and rebound effects, e.g. Prestele, Verburg, 2019, The overlooked spatial dimension of climate‐smart agriculture, Global Change Biology; Firbank et al. 2018, Grand Challenges in Sustainable Intensification and Ecosystem Services, Front. Sustain. Food Syst. (also for many)) of intensifying measures. Mitigation potential is amplified where intensification leads to reduce deforestation.	Noted. A box has been added on sustainable intensification in SOD	Charlotte Streck	University Potsdam	Germany
30625	61	31	61	32	Also expanding pasture/grazing lands	Rejected- Pasture/grazing lands has been addressed in other subsections of the chapter.	Raychel Santo	Johns Hopkins Center for a Livable Future, Bloomberg School of Public Health	United States of America

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
46547	61	31	61	33	This sentence assumes that 'land sparing' and intensification are agreed on scientific approaches to mitigation. This is a point of considerable scientific debate which should be reflected in the chapter. Other scientific studies argue that 'land sharing' approach is a more effective measure with many co-benefits. See for example Kremen, C. and A. M. Merenlender, 2018b: Landscapes that work for biodiversity and people. Science, 362, eaau6020, doi:10.1126/science.aau6020.	Accepted – text revised	Rachel Bezner Kerr	Cornell University	United States of America
224	61	35	61	35	Gustavsson et al not in citation list	Editorial	Karen A. Beauchemin	Agriculture and Agri-Food Canada	Canada
18643	61	39	61	41	maybe switch the statements in this sentence: 1) increase between 1960 and 2011 2) in 2011 one-third…	Accepted – text revised	Charlotte Janssens	KU Leuven	Belgium
226	61	40	61	40	Porter and Reay 2016 not in citation list	Editorial	Karen A. Beauchemin	Agriculture and Agri-Food Canada	Canada
9845	61	42	61	42	Define FLW(food loss and waste) at first occurrence. Lay down the difference between food loss and food waste and make sure that the right terminology is used across the text.	Accepted – text revised. In the revised 7.4.5.2. (Reduce food loss and waste) we defined food loss and food waste	Jeanne Bormann	Ministry of agriculture	Luxembourg
27363	61	35	62	9	The "Lancet Diet" is just about to become a benchmark, needs some elaboration here (10.1016/S0140-6736(18)31788-4)	Noted. This will be considered during revision of the subsection.	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
1515	61	38	62	33	The reasons for food losses are different between developed and developing countries. A lot of foods are lost in field in developing countries, in comparison to that lost at home in many developed countries. In addition, the losses rates are very different, e.g. 40% even to 60% (Parfitt et al., 2010; Hall et al., 2009) in a few developed countries, while 19% in China (Liu et al., 2013) . Hence, different measures should be taken in countries with different losses. (1) Hall, K. D.; Guo, J.; Dore, M.; Chow, C. C. The progressive increase of food waste in America and its environmental impact. PLoS ONE 2009, 4 (11), e7940. (2) Liu J., Lundqvist J., Weinberg J., Gustafsson J., 2013. Food losses and waste in China and their implication for water and land. Environmental Science & Technology 47(18): 10137-10144. (3) Parfitt, J.; Barthel, M.; Macnaughton, S. Food waste within food supply chains: Quantification and potential for change to 2050. Philos. Trans. R. Soc. London B, Biol. Sci. 2010, 365 (1554), 3065−3081.	Taken into account- We pointed out to that there are significant regional differences with regard to the stage of the chain at which FLW occur.	JUNGUO LIU	Southern University of Science and Technology	China
9297	61	38	62	33	Suggest the title includes both 'food loss and waste' . The he content of the sub-section is good but I would that it be structured the text so that loss (from harvest along supply chain) and waste (consumer waste) components are more clearly separated. That would help the flow and clarity.	Accepted- We have now revised this section and made a clear distinction between food loss and waste.	Eamon Haughey	Trinity College Dublin	Ireland
17139	61	38	62	33	Here, you compare the food loss and waste in developed countries and in developing countries. Please add the explanation about the case that food that will be exported to developed countries is lossed or wasted in developing countries where the food is cultivated and processed. My take on this case is that developed countries should have responsibility on food loss and waste in developing countries.	Rejected- outside the scope of the chapter/ subsection. Here the focus is on the mitigation potential of reducing FLW	KEIICHI IGARASHI	Mitsubishi UFJ Research and Consulting Co., Ltd.	Japan
19233	61	29	63	9	Generally, the references in the demand-side chapter seem to be outdated and fail to consider the significant additional research that has been conducted in this area in the last 5 years. See also specific comments.	Taken into account -The whole subsection has been substantially revised and more recent references have been cited	Charlotte Streck	University Potsdam	Germany
18175	61	1		3	co2eq instead of CO2e	Editorial	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
21855	61	2			greenhouse gas just write GHG same comment before	Editorial	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
3517	61	8			tCO2e … space…yr-1	Editorial	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
3519	61	18			meaning of CSF	Editorial	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
21857	61	23			m3	Editorial	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
6877	61	33			Fix order of citations if needed.	Editorial	Valasia Iakovoglou	International Hellenic University	Greece
29669	61	33			Johnson et al. 2014; Add this article to the reference	Rejected-The reviewer does not explain why and to which part of the subsection this reference can be added	RAEHYUN KIM	Institute	Republic of Korea
29629	61	35			Hall et al. 2009; Add this article to the reference	Rejected- 1) outdated and the references we cited already support the same arguments, and 2) The reviewer does not explain why and to which part of the subsection this reference can be added	RAEHYUN KIM	Institute	Republic of Korea

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
29697	61	36			Lamb et al. 2016; Add this article to the reference	Rejected- 1) The references we cited are more recent and already support the same arguments, and 2) The reviewer does not explain why and to which part of the subsection this reference can be added	RAEHYUN KIM	Institute	Republic of Korea
10481	61	38			A critical and highly policy-relevant step beyond the SRCCL in this chapter would be an assessment of how much reduction in food loss and waste is actually feasible (in different regions), and at what cost, and what are the critical barriers. The SRCCL identified the issue, can the AR6 now move towards a workable solution? Or if not, can we be clear that this remains unknown and hence the actual mitigation potential from food loss and waste is rather speculative? This would be a key value-add from this assessment.	Accepted-we will regionalise as good as possible	Andy Reisinger	NZAGRC	New Zealand
29749	61	40			Poter and Reay (2016)Add this article to the reference	Accepted-The reference has been added.	RAEHYUN KIM	Institute	Republic of Korea
18177	61	41		41	food loss and wate (FLW)...	Accepted-The text has been revised	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
3521	61	42			meaning of FLW	Accepted-The text has been revised	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
29601	61	43			Foley et al. 2011; Add this article to the reference	Rejected- 1) The references we cited are more recent and already support the same arguments, 2) The revised sub-section has a specific structure in terms of length and content and 3) The reviewer does not explain why and to which part of the subsection this reference can be added	RAEHYUN KIM	Institute	Republic of Korea
29693	61	43			Kummu et al. 2012; Add this article to the reference	Rejected- 1) The references we cited are more recent and already support the same arguments, 2) The revised sub-section has a specific structure in terms of length and content and 3) The reviewer does not explain why and to which part of the subsection this reference can be added	RAEHYUN KIM	Institute	Republic of Korea
29901	61	43			West et al. 2014; Add this article to the reference	Rejected- 1) The references we cited are more recent and already support the same arguments, 2) The revised sub-section has a specific structure in terms of length and content and 3) The reviewer does not explain why and to which part of the subsection this reference can be added	RAEHYUN KIM	Institute	Republic of Korea
9847	62	2	62	2	"is estimated" instead of "estimated".	Accepted-The text has been revised	Jeanne Bormann	Ministry of agriculture	Luxembourg
17141	62	7	62	9	This sentence mentions that the share of developed countries in global GHG emissions due to food loss and waste declined. My take on this point is that the emission from another categories was increaed enormously, therefore the share of emission due to food loss and waste declined. If so, current explassion may lead incorrect information. I recommend to show acctual changes of GHG emissions due to food loss and waste between 1961 and 2011 (xx ton CO2 in 1961, and yy ton CO2 in 2011).	Taken into account-The text has been revised and the whole paragraph has changed.	KEIICHI IGARASHI	Mitsubishi UFJ Research and Consulting Co., Ltd.	Japan
17937	62	15	62	17	Important new study about food waste - says consumer side food waste is double previous estimates https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0228369	Taken into Account- The study has been cited	Luke Spajic	University of Adelaide (graduate student researcher), University of Oxford (visiting student researcher)	Australia
40385	62	27	62	27	the main problem at least fo my perspective, is so called " beauty statarts" to veg etc. add standardisation of vegetables	Rejected- The comment is both unclear and seems to be out of the scope of the section	Gunta Kalvane	University of Latvia	Latvia
40383	62	28	62	28	organic waste sorting	Noted- however the space will not allow to dig into this level intoofand the primary focus of this subsection is on the mitigation potential of reducing food loss and waste .	Gunta Kalvane	University of Latvia	Latvia
19243	62	38	62	39	I do not think one should cast the mitigation potential of better diets as 'more effective than' considering that mitigation measures in the land sector are interconnected and interdependent. Avoided diet shifts in particular in Asian emerging economies are important, as are diet shifts in high-meat consuming countries. The former to avoid further emission growth of agricultural and land-use emissions, the latter to reduce existing emissions. Effective measures rely on behavioral insights, trade measures, regulation and investment in alternative proteins	Noted. This sentence will be revised as part of major changes that are planned for the subsection.	Charlotte Streck	University Potsdam	Germany
13355	62	40	62	42	Grammar/typos in this passage. I think it meanse that reducing meat intake to the recommended healthy levels would reduce mitigation costs, but that is not quite what it says.	Taken into account- The text has been revised	Fred Witham	Rolls-Royce	United Kingdom (of Great Britain and Northern Ireland)
9849	62	41	62	42	Express in terms of 1,5°C / 2°C target set out by the Paris agreement instead of using ppm as unit	Noted	Jeanne Bormann	Ministry of agriculture	Luxembourg

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
15801	62	42	62	42	The Stehfest et al article is from 2006, not from 2009. Citation should be corrected.	Editorial	EDUARDO PEDRO FRACASSI	ITBA Instituto Tecnologico de Buenos Aires	Argentina
15803	62	45	62	48	FAO Experts Anne Mottet and Henning Steinfeld said in their article "The pitfalls of simplification when looking at greenhouse gas emissions from livestock" on Tuesday, 18 September 2018 08:36 GMT states that direct emissions from livestock amount to 5% vs. 14% from transportation. So direct emissions from livestock are 3 times lower than emissions from the transport sector. Moreover, these FAO experts say that there was mistake comparing direct transport emissions (14 %) vs. whole lifecycle livestock emissions (15%), because "the whole lifecycle of transport emissions cannot be calculated". The figure included in the FAO article is very clear. This seems to be comparing apples to oranges. reference: https://news.trust.org/item/20180918083629-d2wf0/ The Springman et al (2016) article also mentions health benefits from plant based diets, and it is important to note that recently World Health Organization retired their support to the EAT Lancet "Planetary Diet" because of health issues and other causes. https://www.bmj.com/content/365/bmj.l1700, so there seems to be some discussion on whether such a diet would be applicable to all the world's population and whether it is indeed healthy. More from FAO: "More Fuel for the Food/Feed Debate New FAO Study indicates that livestock primarily consume foods not fit for human consumption and meat production requires less cereals than generally reported" http://www.fao.org/ag/againfo/home/en/news_archive/2017_More_Fuel_for_the_Food_Feed.html and also the article "Livestock and greenhouse gas emissions: The importance of getting the numbers right" M. Herreroa,*, P. Gerberb, T. Vellingac, T. Garnettd, A. Leip e, C. Opiob, H.J. Westhoekf, P.K. Thorntona, J. Oleseng, N. Hutchingsg, H. Montgomery h,j, J.-F. Soussanai, H. Steinfeldb, T.A. McAllisterj https://www.sciencedirect.com/science/article/pii/S0377840111002021	Noted. The authors thank the reviewer for their point. Major changes are planned for the subsection and this will be taken into consideration during revision.	EDUARDO PEDRO FRACASSI	ITBA Instituto Tecnologico de Buenos Aires	Argentina
27361	62	48	62	48	You could add what we show in Erb etal 2016: a shift in diets allows to reduce deforestation pressures (10.1038/ncomms11382)	Noted. Thank you, this will be considered.	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
9851	62	51	62	54	The difference may probably be explained by the energy level required for different levels of physical activitiy (labor) (higher in India compared to USA).	Noted	Jeanne Bormann	Ministry of agriculture	Luxembourg
9299	62	35	63	9	This sub-section packs in a lot of statements that could do with more nuanced assessment or there is a risk of losing clarity on a contentious topic. For example low meat diets are mentioned but without adding much information on the type of meat (ruminant or monogastric sourced) as well as the production system (grassland vs. indoor fed). This section could use some useful insights into ways of framing the content from Chapter 5 from SRCCL.	Noted. Major changes are planned for the subsection. The reviewer's points will be taken into consideration during revision.	Eamon Haughey	Trinity College Dublin	Ireland
17939	62	35	63	9	Could be more explicit about where business as usual trajectory of dietary emissions would be at 2050 and incompatibility with Paris agreement	Noted. This will be considered.	Luke Spajic	University of Adelaide (graduate student researcher), University of Oxford (visiting student researcher)	Australia
20669	62	35	63	9	This section is very interesting, however is suffers from the fact that it displays "mitigation potentials", but not the critical role that diets may play in clmate change mitigation strategies. I think it might be worthwhile shedding light on the implications of shifting diets and the costs of climate policy, or even the feasibility of mitigation pathways. IAM based mitigation pathways assume that at a high enough cost livestock emissions can either be drastically reduced or even eliminated. In this sense they typically are very "top-down" with little physical counterpart of thier emission reduction. Consequently, these very deep emission reduction levels in livestock production are sparsely supported by existing or even prospective farming practices. A recent in-depth comparison of IAM agricultural emission intensities (for 2C and 1.5C pathways) and national recent reductions and available technology options, have highlighted that reducing livestock may be a necessary pre-requisite of mitigation strategies. Similarly, and IAM scenario which included strict shifts in diets (rather than a technological focus), showed that shifting diets (in combination with other behavioural changes) could vastly reduce mitigation costs and even avoid the need of negative emissions which almost all mitigation pathways on the SR1.5 database depend on. Gil, J.D., Daioglou, V., van Ittersum, M., Reidsma, P., Doelman, J.C., van Middelaar, C.E., van Vuuren, D.P. (2019). Reconciling global sustainability targets and local action for food production and climate change mitigation. Global Environmental Change, 59, 101983 van Vuuren, D. P., and Coauthors, 2018: Alternative pathways to the 1.5 °C target reduce the need for negative emission technologies. Nat. Clim. Chang., 8, 391–397, https://doi.org/10.1038/s41558-018-0119-8.	Noted. The authors thank the reviewer for their point and associated references. Major changes are planned for this subsection and indeed the entire mitigation section on mitigation. Consideration will be given to the reviewer's points.	Vassilis Daioglou	Copernicus Institute of Sustainable Development	Netherlands

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
46197	62	35	63	9	Could the findings of SRCCL be included? "The total technical mitigation potential of dietary changes is estimated as 0.7 – 8 GtCO2eq yr-1 by 2050 (medium confidence)"	Taken into account-The revised text contains a paragraph summarizing the findings of SRCCL	Daniel Ortiz-Gonzalo	Department of Geosciences and Natural Resource Management, Faculty of Science, University of Copenhagen	Denmark
46199	62	35	63	9	Nice section. Should the findings of EAT-Lancet be included? Willett, W., Rockström, J., Loken, B., Springmann, M., Lang, T., Vermeulen, S., … Murray, C. J. L. (2019, February 2). Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems. The Lancet. Lancet Publishing Group. https://doi.org/10.1016/S0140-6736(18)31788-4	Taken into account- We will consider this comment during the revision of the subsection	Daniel Ortiz-Gonzalo	Department of Geosciences and Natural Resource Management, Faculty of Science, University of Copenhagen	Denmark
1435	62	35	63	10	Worldwide 2 billion hectares of grasslands are used for cattle production, of which 1.3 billion can only be grazed and not used for crops for human consumption (Mottet et al 2017). Claims favouring low meat intake are scientifically challenged (Leroy and Cofnas, 2019). Meat is a well-known high quality food for humans rich in essential aminoacids, EPA, DHA omega-3, haem iron, vitamins B12 and D3, creatine, carnosine, taurine, particularly important in brain development of babies. The latter is relevant as studies have shown the risk run by vegan mothers not having meat in their diets before conception until the end of breastfeeding (Racioppi, et al., 2017 and Aguirre et al., 2019). Not to say the effect of the lack of these nutrients in less affluent societies where hunger and undernourishment are rampant. Therefore, meat consumption has to be considered also as a contribution to achieve United Nations SDG goal 2 Zero Hunger. The energy used by cattle derives from CO2 fixation through photosynthesis. This is not the case for the energy used in meat substitutes as cell- based products were mainly fossil energy is used. The result is CO2 emissions. CO2 remains in the atmosphere longer than CH4 derived from enteric fermentation (Bonny et al., 2017 and Lynch and Pierrhumbert, 2019). Therefore, both factors have to be taken into account when referred to GHG emissions. Furthermore, the use of such a significant land area through grazing implies that carbon sequestration is more relevant than previously thought (Dass et al 2018, Paige et al 2018 and Viglizzo et al 2019) the same applies to agroforestry (Cardinael et al., 2018). These systems enhance soil fertility, prevent soil erosion, are beneficial to biodiversity and in the case of agroforestry improve income of farmers derived from wood and livestock grazing the pastures sown within the forest (Cardinael et al 2018). References Aguirre. D.A., M. L. Donato, M. Buscio, V. Ceballos, M. Armeno, L. Aizpurua and L. Arpi. (2019) Serious neurological compromise due to vitamin B12 deficiency in infants of vegan and vegetarian mothers. Arch Argen Pediatr 2019;117(4):e420-e424 http://dx.doi.org/10.5546/aap.2019.e420 Bonny, P.F., G.E Gardner, D. W Pethick and J.F. Hocquette, 2017. Artificial meat and the future of the meat industry. Animal Production Science https://doi.org/10.1071/AN17307 Cardinael, R., V. Umulisa, A.Toudert, A. Olivier, L.Bockel and M. Bernoux 2018. Revisiting IPCC Tier 1 coefficients for soil organic and biomass carbon storage in agroforestry systems. Environ. Res. Lett(2018) 124020 https://doi.org/10.1088/1748-9326/aaeb5f	Noted. The authors thank the reviewer for their points and associated references. Changes are planned for the subsection, and indeed the entire section. The reviewer's points will be taken into consideration.	Juan Jose Grigera Naón	Sociedad Rural Argentina (member of ICC Argentine branch)	Argentina
30629	62	36	63	9	If talking about the importance of dietary shifts, it's also worth emphasizing (or avoiding) potential rebound effects from focusing solely on reduced "meat consumption"- e.g., increasing reliance on vegetal based feeds for aquaculture operations will impact future land use scnearios: Fry et al. (2016). Environmental health impacts of feeding crops to farmed fish. Environment international, 91, 201-214.	Noted. This point will be considered for inclusion. Thank you for the associated reference.	Raychel Santo	Johns Hopkins Center for a Livable Future, Bloomberg School of Public Health	United States of America
46549	62	36	63	9	Good to see this discussed, more assessment of literature could be done including Willett, W. et al., 2019: Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems. The Lancet, 393, 447-492, doi:10.1016/S0140-6736(18)31788-4.	Taken into account- We will consider this comment during the revision of the subsection	Rachel Bezner Kerr	Cornell University	United States of America
30627	62	51	63	6	Would be worth emphasizing that none of the recommended healthy diets assessed by Ritchie et al. (2018) had GHG footprint low enough to stay within the recommended GHG limit proposed by the EAT-Lancet Commission (Willet et al, 2019).	Taken into account- We will consider this comment during the revision of the subsection	Raychel Santo	Johns Hopkins Center for a Livable Future, Bloomberg School of Public Health	United States of America
3523	62	2			it is Alexander et al. 2015 and not 2017	Accepted-The text has been revised	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
29519	62	2			Alexander et al. 2017; Add this article to the reference	Accepted-I think the reviewers refers to Alexander et al., 2016. The reference was added.	RAEHYUN KIM	Institute	Republic of Korea
20181	62	4		5	Has food waste also grown on a per capita basis?	Rejected-Unclear.	Henry Neufeldt	UNEP DTU Partnership	Denmark
29751	62	4			Poter et al. 2016; Add this article to the reference	Noted- This comment will be considered in the revisions of the sub-section	RAEHYUN KIM	Institute	Republic of Korea

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
29579	62	13			FAO (2013) Add this article to the reference	Rejected- We cited more recent references from FAO	RAEHYUN KIM	Institute	Republic of Korea
3525	62	15			meaning of FLW	Accepted- Definition of food loss and food waste have been added.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
18181	62	23		23	"... Of food loss and wate" could be FLW	Accepted- the text has been revised.	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
29537	62	26			Blanke, 2015; Add this article to the reference	Noted- This comment will be considered in the revisions of the sub-section	RAEHYUN KIM	Institute	Republic of Korea
29755	62	26			Quested et al. 2013; Add this article to the reference	Noted- This comment will be considered in the revisions of the sub-section	RAEHYUN KIM	Institute	Republic of Korea
29779	62	29			Schanes et al. 2016; Add this article to the reference	Noted- This comment will be considered in the revisions of the sub-section	RAEHYUN KIM	Institute	Republic of Korea
29905	62	29			Wilson et al. 2017; Add this article to the reference	Noted- This comment will be considered in the revisions of the sub-section	RAEHYUN KIM	Institute	Republic of Korea
29689	62	33			Krause et al. 2016; Add this article to the reference	Noted- This comment will be considered in the revisions of the sub-section	RAEHYUN KIM	Institute	Republic of Korea
10483	62	35			It seems odd that a mitigation option that could avoid more emissions than all supply side measures combined gets not even one A4 page of space. More importantly perhaps, I can't find a single conclusion on the potential cost, feasibility, and barriers to dietary change as demand-side mitigation option. This is an important and highly policy relevant part of the assessment. It may be that the authors assume that this will be covered in chapter 12 - but then please provide a clear handshake to that chapter (and note that the outline for chapter 7 explicitly covers demand-side options).	Taken into account- However, the length of this subsection must not exceed a single A4 page.	Andy Reisinger	NZAGRC	New Zealand
29707	62	39			Macdiarmid, 2013; Add this article to the reference	Rejected- In this the sub-section, we focus on the literature that has been published since SRCCL report.	RAEHYUN KIM	Institute	Republic of Korea
29727	62	39			Nemecek et al., 2016; Add this article to the reference	Noted- This comment will be considered in the revisions of the sub-section	RAEHYUN KIM	Institute	Republic of Korea
3527	62	40		42	low-meat diets (reduced to the recommended healthy levels) can halve mitigation costs needed to achieve the 450 ppm Coée target cmpared as business-as-usual.	Rejected- no reference provided the argument	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
3529	62	42			Alexander et al. 2015	Accepted- This reference is already cited.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
29763	62	51			Ritchiea et al. 2018; Add this article to the reference	Taken into account- This will be considered during the revisions of the sub-section	RAEHYUN KIM	Institute	Republic of Korea
3531	62	52			"that" is in excess	Editorial	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
14839	62	54			Reference related to Indian study (Pathak H., Jain N., Bhatia A., Patel J., Aggarwal P.K., (2010) Carbon footprints of Indian food items, Agriculture Ecosystem and environment, 139: 66–73.)	Rejected- In this the sub-section, we focus on the literature that has been published since SRCCL report.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
18179	62				co2eq instead of CO2e	Accepted- the text has been revised.	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
38857	63	3	63	4	Please use consistent language when referring to the temperature goals in Article 2 of the Paris Agreement. There are no temperature "targets".	Rejected- There is no reference to any "temperature" nor the Paris Agreement in this subsection	Julian Reyes	Personal Capacity	United States of America
15805	63	6	63	6	It is important to note that recently World Health Organization withdraw their support to the EAT Lancet "Planetary Diet" because of health issues and other causes. https://www.bmj.com/content/365/bmj.l1700, so there seems to be some discussion on whether such a diet would be applicable to all the world's population and whether it is indeed healthy. So there is reasonable doubt on whether the Springman et al (2016) article should be included or not as a reference.	Taken into account- This will be considered during the revisions of the sub-section	EDUARDO PEDRO FRACASSI	ITBA Instituto Tecnologico de Buenos Aires	Argentina
38859	63	6	63	9	What is the "baseline" to compare the 2050 projection? Moreover, are there regional differences in shifts toward a healthier diets?	Noted- the sub-section has been revised and this has been resolved.	Julian Reyes	Personal Capacity	United States of America
19245	63	9	63	19	It may be worth to mention the multiple health and environmental benefits that go along with a reduced-meat diet (e.g. Clark et al. Multiple health and environmental impacts of foods, PNAS November 12, 2019)	Accepted- this has been highlighted in the revised section.	Charlotte Streck	University Potsdam	Germany

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
14841	63	12	63	32	Mitigation co benefits of adaptation options should also be considered.	Rejected. This section is about mitigation.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
41771	63	16	63	17	As well as repeated twice in same sentence.	Accepted. Changed accordingly	Cecile Girardin	University of Oxford	United Kingdom (of Great Britain and Northern Ireland)
41773	63	19	63	19	Extra space before "interact"	Accepted. Changed accordingly	Cecile Girardin	University of Oxford	United Kingdom (of Great Britain and Northern Ireland)
41775	63	19	63	19	check grammar: "and in addition in the"	Accepted. Changed accordingly	Cecile Girardin	University of Oxford	United Kingdom (of Great Britain and Northern Ireland)
32995	63	19	63	21	Incomprehensible sentence. And why so many references for such a generic statement?	Accepted. The sentence has been modified and the number of references reduced.	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
32997	63	19	63	32	Here the term 'Integrative land-use models (ILM)' is introduced, however, I don't think this is a common term in the literature. What kind of models are subsumed under this term and what are the commonalities with and differences compared to IAMs. Doesn't become clear in this paragraph.	Noted. This indeed is not a common term in literature. It has been introduced here to diffentiate between studies focusing only on th eland sector with thos combined with other sectors (IAMs). This explaination is part of the text.	Reinhard Prestele	Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Karlsruhe Institute of Technology	Germany
28829	63	21	63	21	The following paper can be cited: Fujimori S, Hasegawa T, Krey V, Riahi K, Bertram C, Bodirsky BL, et al. A multi-model assessment of food security implications of climate change mitigation. Nature Sustainability 2019, 2(5): 386-396.	Rejected. The number of citations has been reduced due to suggestions of other reviewers.	Tomoko Hasegawa	Ritsumeikan University	Japan
11309	63	12	64	27	Can you develop AFOLU scenarios specific to small islands??	Rejected. The spatial resolution of those models considered does not allow to assess AFOLU scenarios specific to small islands.	Mahmood Riyaz	Maldivian Coral Reef Society	Maldives
12165	63	14	64	27	Please consider to add that IAMs and ILMs have mostly taken into account interventions that can be calculated and implemented on large scale, such as avoided deforestation, dietary change, BECCS. In the real world, appropriate responses in the land sector, especially in agriculture. must always be assessed and decided at the micro-level, while many options that are feasible at the micro level are not captured in overall assessment at the aggregate level (see SRCCL SPM B7).	Accepted. The text now states: 'In general, it has to be considered that IAMs and ILMs have mostly taken into account interventions that can be calculated and implemented on large scale, such as avoided deforestation, dietary change, BECCS.'	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
10489	63	46	64	5	This chapter should (unless chapter 3 is doing this) provide an analysis of which of those options are part of the model baseline or exogenous or endogenous mitigation responses in different models, and whether all IAMs assume the same baseline rate of improvement in agricultural productivity, which ones have some type of non-climate constraint on deployment of some options (like per capita calorie demand, or land availability, or any other sustainability constraints). I.e. it would be really good if this section could help lift the lid on the black box on how IAMs treat mitigation options, and whether this treatment is diverse or homogenous across IAMs. Simply saying that those options are "usually included" doesn't really help much here. My understanding is that the main reason why you want to look at IAMs is that if IAMs present a skewed picture of mitigation options and potentials in AFOLU, then global mitigation pathways, options and costs could be off the mark - and that is clearly a highly policy relevant issue. It would help if this section offered a clearer and more explicit motivation in this direction.	Noted. The detailed description of IAM land modules will be placed in the Annex on Models.	Andy Reisinger	NZAGRC	New Zealand
20183	63	6		9	It's not clear how to understand the numbers presented here.	Noted. This sentence will be revised.	Henry Neufeldt	UNEP DTU Partnership	Denmark
18183	63	7		7	clarify: "other environmental impacts".	Taken into account- The text has been revised.	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
10487	63	12			This section is certainly useful, but could do with more integration and context (which would need to be done in conjunction with chapter 3). I'm looking for the authors to spell out how important A and FOLU mitigation is (or isn't) in achieving 1.5 or well-below 2 degree outcomes. E.g. if the world did everything right in all other sectors but excluded just the A emissions from mitigation, would 1.5 or well-below 2 degrees still be feasible? How much less feasible? The key tools that can be used to answer this question are IAMs, and that's a key reason why this chapter needs and wants to look at IAMs - but there are other studies available that look at this fundamental trade-off. This would provide an important opening and context for the remainder of the material in this section, and I think this issue (how important is AFOLU, and what happens to feasibility of Paris temperature goal if we do less A or less FOLU than indicated by IAM pathways?)	Noted. Such a scenario migh be part of the Illustrative Pathways section (depending on scenario availability).	Andy Reisinger	NZAGRC	New Zealand

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
29641	63	21			Hasegawa 2019; Add this article to the reference	Rejected. The number of citations has been reduced due to suggestions of other reviewers.	RAEHYUN KIM	Institute	Republic of Korea
29659	63	21			Humpenöder et al. 2017; Add this article to the reference	Rejected. The number of citations has been reduced due to suggestions of other reviewers.	RAEHYUN KIM	Institute	Republic of Korea
3533	63	26			needs a dot after (Johnson et al. 2019).	Accepted. Changed accordingly.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
3535	63	37			models. It is influenced by...	Accepted. Changed accordingly.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
18185	63	39		45	too long sentence.	Accept. Editorial.	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
3537	63	40		42	scenarios are based on...	Accept. Editorial.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
21859	63	42		43	et al. 2017) and IPCC, 2019	Accept. Editorial.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
3539	63	43			The sentence needs a dot after and the IPBS global assessment".	Accept. Editorial.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
3541	63	43			The models provide 5 different stories…	Noted. This comment is unclear.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
21861	63	45			This set usually contains, namely:	Accept. Editorial.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
28831	64	5	64	5	The following paper can be cited: Wu W, Hasegawa T, Ohashi H, Hanasaki N, Liu J, Matsui T, et al. Global advanced bioenergy potential under environmental protection policies and societal transformation measures. GCB Bioenergy 2019, 11(9): 1041-1055.	Rejected. Here we only cite Model Intercomparison papers.	Tomoko Hasegawa	Ritsumeikan University	Japan
10491	64	7	64	18	This para should also mention that none of the models include emerging technologies ranging from biochar to nitrification inhibitors to methane inhibitors - many of which are commercially available or at the cusp of commercialisation (and hence no less mature than BECCS, which is deployed widely in those models). This in my view is a key bias in those models that is worth flagging.	Accepted. The text has been modified stating 'Furthermore, those type of models often lack a representation of emerging technologies ranging from biochar to nitrification inhibitors to methane inhibitors (Herrero et al. 2020). More details will covered in the model annex.	Andy Reisinger	NZAGRC	New Zealand
41777	64	8	64	8	Please see Griscom, B. W., et al. National mitigation potential from natural climate solutions in the tropics, Philosophical Transactions of the Royal Society. doi: 10.1098/rstb.2019.0126 (2020). & Busch J., et al. Potential for low-cost carbon dioxide removal through tropical reforestation. Nature Climate Change 96 (9), 463, doi:10.1038/s41558-019-0485-x (2019).	Rejected - the Griscom et al 2017 paper is already included.	Cecile Girardin	University of Oxford	United Kingdom (of Great Britain and Northern Ireland)
18641	64	9	64	10	" … which have the potential to alter the contribution of land-based 10 mitigation in terms of timing, potential and sustainability consequences": this is a bit vague. What wil be specific effect on timing, potential and sustainbility? increase or decrease? how large is the impact?	Noted. A detailed assessment of single options potential will take place in the bottom up assessment of the AFOLU chapter. The text will be modified to refer to this section.	Charlotte Janssens	KU Leuven	Belgium
41779	64	17	64	17	replace REF	Rejected. These are the regions considered.	Cecile Girardin	University of Oxford	United Kingdom (of Great Britain and Northern Ireland)
41781	64	20	64	20	Ref to AR6 database	Accept. Editorial.	Cecile Girardin	University of Oxford	United Kingdom (of Great Britain and Northern Ireland)
9853	64	24	64	24	"due to" instead of "due"	Accept. Editorial.	Jeanne Bormann	Ministry of agriculture	Luxembourg
41787	64	34	64	34	Should it be "interplays"?	Accept. Editorial.	Cecile Girardin	University of Oxford	United Kingdom (of Great Britain and Northern Ireland)
41783	64	34	64	35	Ceck format of referencing throughout et al. vs et al	Accept. Editorial.	Cecile Girardin	University of Oxford	United Kingdom (of Great Britain and Northern Ireland)
6879	64	42	64	43	I would suggest adding reference(s).	Accepted. References will be added.	Valasia Iakovoglou	International Hellenic University	Greece

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
41785	64	45	64	45	What does this mean: "rather zero"?	Accept. Editorial.	Cecile Girardin	University of Oxford	United Kingdom (of Great Britain and Northern Ireland)
11311	64	29	66	14	can you develop Regional GHG emissions and land dynamics from AFOLU for small islands??	Rejected. The models deriving the pathways cannot deliver such a regional disaggregation.	Mahmood Riyaz	Maldivian Coral Reef Society	Maldives
21863	64	2			1st change with first	Accept. Editorial.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21865	64	10			In contrast,	Accept. Editorial.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21867	64	11			(IPCC, 2019)	Accept. Editorial.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
3545	64	12			asses new items: future GHG dynamics…	Accept. Editorial.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
3543	64	17			(REF) to be completed and a dot after (REF).	Accept. Editorial.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
21869	64	17			(REF). In	Accept. Editorial.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
3547	64	20			reference to AR6 database?	Accept. Editorial.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
21871	64	20			In addition,	Accept. Editorial.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
14843	64	24			They vary due to	Accept. Editorial.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
21873	64	34		35	cek theconsistensi of literatre cited	Noted. Editorial.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
20185	64	37		39	Explain that the baseline refers to 2050 and 2100, which essentially projects low efficiency systems into the future	Noted. Comment unclear.	Henry Neufeldt	UNEP DTU Partnership	Denmark
21875	64	42		47	cited from literature?	Rejected. The text clearly refers to the related figure in this section.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
29015	65	1	65	1	I can't see Figure 7.24 clearly	Noted. Figure quality will be improved.	Marissa Malahayati	National Institute for Environmental Studies	Japan
43351	65	2	65	14	In this figure (and some of the following) it is not clear which SSP is used (the average of all?)	Accepted. Text has been updated for clear reference of use of scenarios.	Giacomo Grassi	Joint Research Centre, European Commission	Italy
39711	65	23	65	24	This paragraph again ignores that BECCS must not require large land, see page 55 lines 1-4 in this chapter.	Accepted. This paragraph has been modified to make clear that bioenergy area refers to dedicated 2nd generation bioenergy crops.	Uwe Fritsche	IINAS	Germany
14845	65	23	65	28	Is it due to plantation of oil palm and soybean crops?	Accepted. This paragraph has been modified to make clear that bioenergy area refers to dedicated 2nd generation bioenergy crops.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
9855	65	25	65	26	Missing figures.	Accepted. The text hs been modified to highlight that this section is a description of fig 7.24	Jeanne Bormann	Ministry of agriculture	Luxembourg
41789	65	25	65	26	replace X, Y, and Z	Accepted. Editorial.	Cecile Girardin	University of Oxford	United Kingdom (of Great Britain and Northern Ireland)
18647	65	28	65	28	"but also on the economy (e.g. food prices) (see subsection on SDGs below)." not clear to which subsection is referred to: discussion of Figure 7.28, discussion of Table 7.12 or subsection 7.7.3?	Accepted. The text has been modified accordingly.	Charlotte Janssens	KU Leuven	Belgium
3549	65	1			in figure 7.24, nothing indicates that the top or down figures are for 2050 or 2100. For clarification, I advice the figure 7.24 to be split in two figures.	Rejected. Both figures are labeled with the respective year.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
10493	65	1			Please consider getting graphic design support for this figure to make it more easily readable (at a minimum changing the x-axis scales). This is potentially a very useful summary figure that deserves substantial communications support	Noted. We will do so after discussion with the TSU.	Andy Reisinger	NZAGRC	New Zealand

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
43675	65	1			The IAM database report large BECCS contributions. But the literature is also quite clear that large-scale bioenergy/BECCS entails high risks for biodiversity/food etc, as acknowledged in the special report on land and also contributors of this chapter, and many others. The IAM scenarios only tentaviely operationalize these risks. How could these views be better reconciled? An uncommented version of this figure does not help this reconciliation.	Noted. This section covers the area. Consequences of such dynamics will be discussed in other sections.	Felix Creutzig	MCC Berlin	Germany
21877	65	2		14	Figure 7.24 title should be summarized its too long	Noted. editorial.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21879	65	15		18	have data increase or decrease agriculture?	Noted. Comment unclear.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
20187	65	20		28	As explained earlier, the use of BECCS hinges entirely on a plausible narrative to continue feeding a growing population while maintaining essential ecosystem services. SRCCL and IPBES show that climate change will strongly affect food security and the provision of ecosystem services and that there are a lot of land-based mitigation options, but that bioenergy and afforestation will also lead to serious tradeoffs with food security if implemented at large scale. While I do not believe that it has to be that way, the mitigation community needs to understand the consequences of food and water insecurity better and offer narratives that address these apparently diverging goals. To that end, closer liaison with several of the WG2 chapters (2, 4, 5 and 8) would be extremely important for a coherent messaging.	Noted. We will check for consistency with WG2 chapters.	Henry Neufeldt	UNEP DTU Partnership	Denmark
21881	65	21			afforestation. In addition	Accepted. Editorial.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21883	65	22		23	why?	Rejected. The level of analysis does not allow further investigation into detailed drivers behind the model results.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
3551	65	25		26	Values of X, Y, Z are missing	Accepted. Values will be filled in.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
18187	65	25		26	X,Y,Z pending values	Accepted. Values will be filled in.	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
29017	66	1	66	14	I can't see Figure 7.25 clearly	Accepted. High resolution figure will be provided.	Marissa Malahayati	National Institute for Environmental Studies	Japan
27365	66	16	66	19	other appraoches exist as well and should be mentioned, as they are complementary to economic cost curves, see eg. 10.1088/1748-9326/ab6c2e	Noted. We will check whether this type of approach would fit better in the Section 7.4	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
12277	66		66		Figure 7.25: Compared to baseline, croplands and pasture lands seem projected to be decreased to achieve targeted global temperature scenarios. The extent should be estimated to sustain increased food supply to be required with the growing population.	Noted. This will be considered.	Mohammad Ibrahim Khalil	University College Dublin	Ireland
22197	66	21	67	7	Sentence justification	Rejected. Comment not clear.	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
10495	66	1			Please consider getting graphic design support for this figure to make it more easily readable (at a minimum changing the x-axis scales). This is potentially a very useful summary figure that deserves substantial communications support	Noted. We will do so after discussion with the TSU.	Andy Reisinger	NZAGRC	New Zealand
21885	66	2		14	Figure 7.25 title is too long and confused	Noted. editorial.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
10497	66	16			I'm surprised not to see the analysis by Harmsen et al 2019 (Harmsen JHM, Van Vuuren DP, Nayak DR et al (2019) Long-term marginal abatement cost curves of non-CO2 greenhouse gases. Environmental Science & Policy 99: 136-149) used as a basis for this section? That work also includes a very helpful comparison of bottom-up vs top-down MACCs.	Noted. We will see how Harmsen et al 2019 can be integrated in the assessment here or in Section 7.4	Andy Reisinger	NZAGRC	New Zealand
37461	66	16			This section on MACCs could benefit from a more upfront consideration of the assumptions that underlie the model runs included, and how these affect the results. e.g. what discount rates are used and how does this affect the amount of BECCS considered available.	Noted. We will consider including a discussion of the role of discount rates.	Michiel Schaeffer	Climate Analytics	Netherlands
3553	66	22			CO2e instead of CO2-eq, and needs a space before yr-1	Accepted. Editorial	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
29019	67	19	67	21	I know it is the model output, but… would you mind to explain those four scenario on Figure 7.26. I think you need to explain further about it.	Accepted. Further explanation will be provided.	Marissa Malahayati	National Institute for Environmental Studies	Japan
18191	67	1		1	BECCS meaning introduced earlier, no needed here.	Rejected. We are not explaining here.	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
21887	67	8		15	become 1 paragraph	Accepted. Will be modified accordingly unless the text substantially changes.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
20189	67	12		15	Does this experiment only include AFOLU options or is it reflective of the entire economy?	Accepted. Will be explained that the experiment considers the entire economy although only results for AFOLU and BECCS are presented.	Henry Neufeldt	UNEP DTU Partnership	Denmark
3555	67	19		20	The different cases are not well identified in the title of each graph in figure 7.26	Accepted. Figure 7.26 caption will be expanded.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
18189	67	19		23	missing units in X-axis	Accepted. X-axis title incl. units will be added.	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
10499	67	20			Given the limited likelihood of carbon prices of up to $1000/tonne being applied to agricultural emissions, I would encourage the authors to change the scales so that prices are in a more policy relevant, realistic range (or offer a second figure with such a more policy relevant focus). I.e. prices up to $100 at the very most.	Noted. We will consider changing the scale.	Andy Reisinger	NZAGRC	New Zealand
43285	67	21			I do not understand what the graphs are supposed to show. Needs more text to describe.	Accepted. Figure 7.26 caption will be expanded.	Deborah Lawrence	University of Virginia	United States of America
15121	68	11	68	17	Low resolution on Figure 7.27	Accepted. High resolution figures will be provided.	Levihn Fabian	KTH - Royal Institute of Technology	Sweden
18645	68	22	68	26	It could also be informative to test whether the findings are robust to the impact of the different SSP scenarios e.g. do we see the same time trend for each SSP separately?	Noted. We will consider the treatment of the SSP dimension.	Charlotte Janssens	KU Leuven	Belgium
35895	68	22	68	32	With the caveats listed one has to question the validity of the model outcomes on BECCS. Also it appears that the methodology carries with it the risk om model artefacts influencing the results. How severe are the caveats?	Noted. The analysis will be updated with the full AR6 scenario database results.	Niclas Scott Bentsen	University of Copenhagen, Department of Geosciences and Natural Resource Management	Denmark
20671	68	24	68	26	OK, but this is not a reason to exclude EMF33. Obviously the NoBECCS scenarios should not be included in the BECCS MACC, but the rest should be fine. The difference in the MACCs for CH4/N2O/LUC/SEQU between the scnearios with and without BECCS would be the alternative possibilities for the land use sector given the availability of BECCS. This seems like not only and interesting result, but an important discussion point which should be given some space as it highlights the tradeoff, and shifting priorities, if BECCS were to be avoided or does not prove feasible	Noted. The analysis will be updated with the full AR6 scenario database results.	Vassilis Daioglou	Copernicus Institute of Sustainable Development	Netherlands
22199	68	38	68	38	Consistency in terminology use on "1.5oC"	Accepted. Editorial	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
18651	68	35	71	7	Figure 7.28 include the impact of the different pathways on food prices, but there is no description of the food price effects in the 'Illustrative Pathways' section.	accept, the section will be improved	Charlotte Janssens	KU Leuven	Belgium
18193	68	11		15	missing units in X-axis	Accepted. X-axis title incl. units will be added.	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
14847	68	13			While preparing MACCs mitigation co benefits of adaptation options should also be considered.	Rejected. Available scenarios do not consider climate change impacts and adaptation.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
20191	68	17		20	The question always is: what happens to land all the bioenergy is supposed to come from?	Noted. Land use implications will be discussed here or in a more suitable sub-section.	Henry Neufeldt	UNEP DTU Partnership	Denmark
21889	68	17			In Figure 7.27,	Accepted. Figure 7.27 caption will be expanded.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21891	68	17			5 global regions and 4 different time steps. Pls mention them 5 dan 4?	Accepted. Figure 7.27 caption will be expanded.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
10501	68	35			Chapter 3 is also developing illustrative pathways, and it is highly confusing if this chapter uses a different set. Please consult and work with chapter 3 to see if their illustrative pathways can be used here, and then at best perhaps supplement those pathways with an additional nuance - but don't develop your own illustrative pathways in isolation.	Accepted. Discussions happened with ch3 and other chapters for harmonizing of IPs.	Andy Reisinger	NZAGRC	New Zealand
18649	69	1	69	2	"focusing besides global emission and land-use consequences on regional dynamics and consequences on food security": a reference could be made to the specific subsections where regional dynamics and food security issues are discussed.	Noted. Based on data availability this will happen in this section.	Charlotte Janssens	KU Leuven	Belgium
18653	69	6	69	6	RCP2.6 should be RCP1.9 (idem comment for line 24). Reference of Pathway 1 is Fujimori et al. 2017 according to caption of Figure 7.28.	Accepted. Text will be modified accordingly.	Charlotte Janssens	KU Leuven	Belgium

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
44649	69	13	69	21	I'm not sure if playing with emission sector boundaries is a good idea, at least if it runs counter with UNFCCC inventory practices or IPCC guidelines, or - like in this case - (inadvertently) highlights a position increasingly used by the agricultural sector in net zero GHG debates. Right now, the accounting for negative carbon delivered by BECCS does indeed not happen in the countries that grow the biomass, and if that stays like that (it likely will) one would need other mechanisms for sharing the benefits (see https://www.nature.com/articles/nclimate3369 and https://www.tandfonline.com/doi/full/10.1080/14693062.2018.1509044)	Noted. To be discussed.	Oliver Geden	German Institute for International and Security Affairs	Germany
37463	69	18	69	21	This statement about the timing of GHG neutrality when BECCS CDR is accounted in the energy sector is not very clear	Noted. To be discussed.	Michiel Schaeffer	Climate Analytics	Netherlands
18655	69	23	69	23	add reference of pathway 2 (Fricko et al. 2017)	Accepted. Text will be modified accordingly.	Charlotte Janssens	KU Leuven	Belgium
22405	69	3		3	"...Carbon Dioxide Removal (CDR)" has been presented many times earlier. To decide when is needed or jus named CDR	Noted. Editorial.	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
29609	69	6			Fricko et al. 2017; Add this article to the reference	Accepted. Text will be modified accordingly.	RAEHYUN KIM	Institute	Republic of Korea
29795	69	12			Stevanović et al. 2017; Add this article to the reference	Accepted. Text will be modified accordingly.	RAEHYUN KIM	Institute	Republic of Korea
21893	69	13			In addition,	Accepted. Editorial.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
22407	69	15		21	But this scenario should be carefully evaluated if implemented since there are many interactions with other ecosystem services, mentioned earlier in the report, as well as later on	Accepted. The IPs will be interpreted as broad as possible based on data availability.	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
29691	69	29			Kriegler et al. 2017; Add this article to the reference	Accepted. Text will be modified accordingly.	RAEHYUN KIM	Institute	Republic of Korea
29545	69	31			Calvin et al. 2014; Add this article to the reference	Accepted. Text will be modified accordingly.	RAEHYUN KIM	Institute	Republic of Korea
26921	70	1	70	5	Avoiding using red and green will make the graphic more readable by people who are RG color blind (like myself).	Accepted. Figures will be updated.	Louis Verchot	International Center for Tropical Agriculture	Colombia
17311	70	1	71	7	Figure 7.28, panel A: Please check - there are "holes" in the emissions from land use. If the drawing is not cumulative, and these emissions are thus "hidden" behind the other emissions, please consider changing the layout.	Noted. Figures will be updated.	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany
3561	70	1		2	I suggest to split the figure 7.28 in three parts, and to explain each part in greater details.	Noted. Figures will be updated.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
3557	70	1			I don't understand the figure 7.28, which would desserve a comment to understand what it stands for.	Noted. Figures will be updated.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
3559	70	1			Under the three graphs A, the caption is not clear.	Noted. Figures will be updated.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
21895	70	2			Figure 7.28 title is too long	Noted. Figures will be updated.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
43965	70				cross-referencing to pathways of SR1.5 would be useful, stating to what extent they are similar or different?	Noted. Cross-referencing to SR1P5 will happen if possible.	Hans Poertner and Elvira Poloczanska	Alfred-Wegener-Institut	Germany
16643	71	12	71	12	when you say "This amounts to 8% of the net carbon sink between 1992 and 2012," I need another word. Is thins carbon sink held on average or is it that lost or what?	The net increase in land based carbon stocks estimated to be 94.3 Pg CO2 by IPCC and it appears 8% of this may have been due to direct actions by people to accomplish this. The land based sink of course is not permanent.	Bruce McCarl	Texas A & M University	United States of America
20059	71	12	71	13	"We have quantified around 7.8 Gt CO2 sequestered directly due to policies and measures implemented for climate change mitigation through the CDM, REDD+, and other policies.": please, substantiate, explain the calcuations	Will improve explanation in SOD. The net increase in land based carbon stocks estimated to be 94.3 Pg CO2 by IPCC and it appears 8% of this may have been due to direct actions/efforts to increase storage.	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)
38645	71	12	71	13	Unfortunately, it is difficult to support this mitigation quantification of 7.8 Gt-CO2 sequestration. As the source data of Table 7.3 is based on only a part of mitigation activities in the world and the largest historical scheme of LULUCF sector, which is LULUCF activities under the Kyoto Protocol for Annex I parties are totally excluded from this evaluation. It is better to search other studies.	Great point. Will try to clarify with additional review of literature and BERs by country. If we cannot quantify, will note the limitation.	Atsushi Sato	Mitsubishi UFJ Research and Consulting Co.,Ltd.	Japan
9917	71	12	71	15	There is a strong presumption that counterfactual scenarios are overestimated in carbon management schemes, especially during the initial periods (eg. first period of the EU ETS, Forest reference levels of KP CP2, ...). The verification stringency of biennial reviews is also much lower than for the CDM which itselfs was not immune of baseline inflation. Therefore "we estimate" is a strong wording for such a sentence. A phrasing like "countries have claimed 7.8 Gt CO2 sequestered" is more appropriate. Such a change would be consistent with the following paragraph, stating that "evidence is mixed".	Thanks. Will clarify in SOD and include more discussion about certainty levels.	Valentin Bellassen	INRAE	France
11313	71	12	71	18	why net carbon sink and forest stocks between 1992 and 2012 is used? Is it the base year? Why much later time period is not used???	Will update for SOD with new numbers from WG1.	Mahmood Riyaz	Maldivian Coral Reef Society	Maldives

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
47247	71	20	71	37	Limited assessment of PES and mitigation potential. More assessment of literature needed here, including co-benefits or potential maladaptation. See for example Oliveira Fiorini AC, Mullally C, Swisher M, Putz FE. Forest cover effects of payments for ecosystem services: Evidence from an impact evaluation in Brazil. Ecological Economics. 2020;169. doi:10.1016/j.ecolecon.2019.106522.	Agree, will include additional assessments of PES literature in SOD>.	Rachel Bezner Kerr	Cornell University	United States of America
26637	71	25	71	25	Environmental protection can be achieved through command and control instruments or market-based instruments. Which instrument is the most effective one is not yet established. Protected areas belong to the first category and are key instruments dedicated to the preservation of tropical forests. Their effectiveness is sometimes questioned. First, the protection provided by the protected area may not be effective. Then protected areas can be primarily located in regions where the deforestation pressure is lower because further away from roads and markets (location bias). Finally, protected areas can shift deforestation to unprotected areas (deforestation leakage). Some legal forms of protected areas (integral and indigenous areas) contribute to the preservation of forests in the Brazilian Legal Amazônia. Besides, a protected area in one region also reduces deforestation in neighboring regions by making access to the neighboring forest more difficult (A. Amin, J. Choumert-Nkolo, J.-L. Combes, P. Combes Motel, E.N. Kéré, J.-G. Ongono-Olinga, S. Schwartz, 2019, Neighborhood effects in the Brazilian Amazônia: Protected areas and deforestation, Journal of Environmental Economics and Management, 93, 272-288). This result is consistent with that obtained in another study that specifically controls for the local socio-economic context that influences deforestation decisions: protected areas have slowed down deforestation in Brazil between 2005 and 2009 (Kere N.E., J. Choumert, P. Combes, J. Louis, O. Santoni, S. Schwartz, 2017, Addressing contextual and location biases in the assessment of protected areas effectiveness on deforestation in the Brazilian Amazônia, Ecological Economics, 136, 148-158).	Thanks for the citations. will expand discussion of protected areas in SOD.	Pascale Combes Motel	University of Clermont Auvergne	France
46897	71	35	71	37	I'm aware that you can give only a selection of examples. However, the EU spends billions of Euro each year on agri-environmental measures, A considerable share is direct towards SOC improvement.	Will include additional assessment of policies in EU and other countries through review of BERs and additional literature for SOD.	Martin Schönhart	University of Natural Resources and Life Sciences, Vienna	Austria
20193	71	47	72	6	There is a big difference between property rights and secure tenure rights. It is not necessary to (privately) own land to protect forests. As you point out, by providing secure tenure arrangements there can be excellent forest stewardship (with all the positive carbon storage, biodiversity and regulating ecosystem services as a side effect) . But it does require creating and enforcing appropriate forest codes to protect indegenous peoples against the interests of farming and mining industries.	Agreed. Will improve language on this point in SOD.	Henry Neufeldt	UNEP DTU Partnership	Denmark
35897	71	11	74	43	The section on policy successes in the past 20 years (7.7.1.) focus mainly on forest policies and certification schemes. Also of relevance to AFOLU, however indirectly, are policies and initiatives on bioenergy sustainability. See e.g. Larsen, S., et al. (2019). "Implementation of voluntary verification of sustainability for solid biomass—a case study from Denmark." Energy, Sustainability and Society 9(1): 33; and Bentsen, N. S., et al. (2019). "Sustainability governance of the Danish bioeconomy — the case of bioenergy and biomaterials from agriculture." Energy, Sustainability and Society 9(1): 40, on governmental and voluntary sustainability certification initiatives.	Noted. Will include additional discussion on biofuels/biomass energy in SOD.	Niclas Scott Bentsen	University of Copenhagen, Department of Geosciences and Natural Resource Management	Denmark
38647	71	11	74	43	I wonder why anything about agriculture mitigation and LULUCF mitigation under the Kyoto Protocol have not analyzed or referred here.It is considered the most official and widely recognized AFOLU policy is the past 20 years.	Noted. Will clarify with additional review of literature and BERs by country. If we cannot quantify, will note the limitation.	Atsushi Sato	Mitsubishi UFJ Research and Consulting Co.,Ltd.	Japan
43061	71	11	74	43	The detailed assessment of policy instruments focuses primarily on the emissions impact of the policies, however they could be evaluated across multiple assessment criteria (including economic effectiveness, political feasibility, transformative potential etc.). Further, if the literature exists, the assessment could present more comparative statements between types of policy instruments to guide policy makers on the relative merits of different instrument types.	Noted. Will include broader assessment in SOD.	Parth Bhatia	Centre for Policy Research, New Delhi	India
43063	71	11	74	43	There could be a greater focus on the distributional effects of any of the policy instruments mentioned in the section	Noted. Will include broader assessment, including distributional effects, in SOD.	Parth Bhatia	Centre for Policy Research, New Delhi	India
28799	71	9	87	8	Economic and social aspects are important topics, and the section "Assessment of economic, social and policy responses" is well-prepared. I think the authors have reviewed all attributes in this sections and no need to any changes.	Thanks.	Alireza Yazdani	Shiraz University	Iran
26923	71	9	87	13	This section is mostly a literature review, not an assessment. Please reframe it as an assessment with uncertainty language.	Agreed. Will improve discussion on assessment in the SOD.	Louis Verchot	International Center for Tropical Agriculture	Colombia
20061	71	9	87	15	There is a complete lack of information on how policies, schemes, colutnary actions etc. in agriculture, the food production suply chain, food trade and food consumption affect GHG emissions. Amongts many other things a few examples which - in my opinion - should be mentioned, with papers analysiing them: regulations (like N regulations in Europe, N trading in New Zealand, fertiliser subsidies in Asia, the (very few0 elemnts of CAP relevant to GHG emissions, emerging farm GHG trading schemes, supply chain initiatives (like Arla, Danish Crown, Sainsbury's, Danone), policies and development aid progammes improving agriculture's long term effectiveness in developing countries.	Noted. Will improve discussion on agricultural policies in SOD.	Vera Eory	Scotland's Rural College	United Kingdom (of Great Britain and Northern Ireland)

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
28457	71		87		Regarding new and emerging technologies, it might be useful to elaborate on the impacts of technologies used in 'smart farming', 'digital agriculture' and 'precision farming' in terms of climate change. The chapter highlights that technologies to reduce emissions are available but they are not widely used so far, so it might be necessary to dig deeper in reasons that impede their acceptance and adoption (e.g. social, cultural, behavioral, institutional/political, technical, etc.).	Noted and agreed. The SOD will include assessment accounting for these factors.	Hamid El Bilali	International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM-Bari)	Italy
16593	71	12	#REF!	####	when you say "This amounts to 8% of the net carbon sink between 1992 and 2012," I need another word. Is thins carbon sink held on average or is it that lost or what?	(see comment 16643) The net increase in land based carbon stocks estimated to be 94.3 Pg CO2 by IPCC and it appears 8% of this may have been due to direct actions by people to accomplish this. The land based sink of course is not permanent.	Bruce McCarl	Texas A & M University	United States of America
14849	71	2			It should be Fricko et al. 2017	Noted. This will be changed.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
29613	71	2			Fujimori et al. 2017; Add this article to the reference	Noted. The reference list will be checked.	RAEHYUN KIM	Institute	Republic of Korea
616	71	9			Land grabbing and green grabbing related to land-based climate change mitigation is now briefly addressed under the section drivers of land use change, but these are also relevant outcomes of AFOLU mitgation measures. It would be relevant to include a further subsection on social aspects of AFOLU mitigation measures, in which potential adverse social impacts (including green grabbing, land conflicts, etc.) are addressed, as well as ways to mitigate them. Selected literaure: 1) Conflicts related to land-based climate change mitgation (general): - Hunsberger, C., Corbera, E., Borras, S.M., De La Rosa, R., Eang, V., Franco, J.C., Herre, R., Sam Kham, S., Park, C., Pred, D., Sokheng, H., Spoor, M., Thein, S., Thu, K., Thuon, R., Vaddhanaphuti, C., Woods, K., Work, C., 2015. Land-based climate change mitigation, land grabbing and conflict: understanding intersections and linkages, exploring actions for change. MOSAIC Res. Proj. https://doi.org/10.1111/j.1467-629X.1980.tb00220.x - Franco, J.C., Borras, S.M., 2019. Grey areas in green grabbing: subtle and indirect interconnections between climate change politics and land grabs and their implications for research. Land use policy 84, 192–199. https://doi.org/10.1016/j.landusepol.2019.03.013 - Borras, S.M., Franco, J.C., Nam, Z., 2020. Climate change and land: Insights from Myanmar. World Dev. 129, 104864. https://doi.org/10.1016/j.worlddev.2019.104864 2) Conflicts to reforestation and afforestation projects - Gerber, J.F., 2011. Conflicts over industrial tree plantations in the South: Who, how and why? Glob. Environ. Chang. 21, 165–176. https://doi.org/10.1016/j.gloenvcha.2010.09.005 - Olwig, M.F., Noe, C., Kangalawe, R., Luoga, E., 2016. Inverting the moral economy : the case of land acquisitions for forest plantations in Tanzania. Third World Q. 6597. https://doi.org/10.1080/01436597.2015.1078231; - Scheidel, A., Work, C., 2018. Forest plantations and climate change discourses: New powers of 'green' grabbing in Cambodia. Land use policy 77, 9–18. https://doi.org/10.1016/j.landusepol.2018.04.057; -Lyons, K., Westoby, P., 2014. Carbon colonialism and the new land grab: Plantation forestry in Uganda and its livelihood impacts. J. Rural Stud. 36, 13–21. https://doi.org/10.1016/j.jrurstud.2014.06.002 3) Conflicts over forest conservation areas -Schleicher, J., Zaehringer, J.G., Fastré, C., Vira, B., Visconti, P., Sandbrook, C., 2019. Protecting half of the planet could directly affect over one billion people. Nat. Sustain. 2, 1–3. https://doi.org/10.1038/s41893-019-0423-y	Noted and thanks for citations. Will address these topics in re-organized SOD.	Arnim Scheidel	Institute of Environmental Science and Technology (ICTA), Autonomous University of Barcelona (UAB)	Spain
5927	71	9			Much of this section 7.7 is repetition from earlier sections, The whole chapter currently reads as a series of articles written by different authors. The task now is for CLAs and all co-authors to edit heavily and produce a readable chapter without duplication and in a logical sequence with cross-referencing between various sections and other chapters as needed.	noted and agreed. The SOD will improve integration.	Ralph Sims	Massey University	New Zealand
10503	71	9			It is striking that agriculture is almost entirely absent from this entire section. This bias is difficult to defend. There is enough literature out there I think to warrant a dedicated look, even if the conclusion from the assessment is that climate policy for agricultural GHGs is underdeveloped in comparison to FOLU - that in itself is a key policy-relevant finding, which feeds into the broader conclusion that much of the mitigation potential at carbon prices >$0 remains purely theoretical because governments (and private sector) so far have not yet implemented any policies that impose a price, or shadow price, on agricultural emissions - in contrast to fossil CO2 emissions. This then feeds back in the analysis that I think that Section 7.6 would provide, which is that agriculture mitigation is actually a really important component of achieving overall 1.5 or well-below 2 degree temperature limits - keeping agriculture off the table effectively means keeping the goals of the Paris Agreement out of reach even if the world does everything right with regard to fossil CO2 emissions.	Noted. Assessment of agriculture will be included more broadly in SOD.	Andy Reisinger	NZAGRC	New Zealand

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
10507	71	9			This section lacks a clear focus and does not offer a systematic assessment of current policies. What I would be looking for is clear information on how prevalent price based policies are (comprehensive or opt-in only, and for afforestation or also deforestation or avoided deforestation), regulatory approaches, innovation policies targeting GHG mitigation, information, voluntary arrangements; for each of those, an assessment of their scale and efficacy. Plus a sense of whether there are commitments and plans to upscale, strengthen and extend those policies in future, but also barriers experienced that may hamper this. Such an assessment would really help better understand how much of the economic mitigation potential identified/confirmed in this chapter is current being realised, how much may or may not be realised in future, what the key barriers are and how they may be overcome, and what this means for actual mitigation outcomes in the real world. Section 7.7.2 tries to do some of this but because it cann't draw on a systematic evaluation of the situation in 7.7.1 this remains very limited and cursory. This assessment would be a key value-add compared to SRCCL and AR5 (SRCCL had some of this in its chapter 7 but this was done only partially, not systematically). Also note there is a whole framework on feasibility developed in chapter 3, please ensure you use that framework here consistently and refer back to it explicitly, not just rely on Dooley and Kartha).	Agree that the systematic assessment needs to be improved. Agreed it would be value added relative to earlier reports. Will address in SOD	Andy Reisinger	NZAGRC	New Zealand
10505	71	14			It seem somewhat irrelevant to me to compare the outcomes from mitigation actions with the total (i.e. including natural) sink. Better to compare with total mitigation across all sectors (but as flagged in my comments on that section, I'm not convinced that your analysis allows you to actually attribute the outcome to actual climate policy, you cannot separate correlation from causation especially outside CDM and a little bit for REDD+.	Noted, however, we do provide information on what has been established via impact analysis. We will endeavor to distinguish this from data provided in BERs and oher government reports, and provide an assessment in SOD.	Andy Reisinger	NZAGRC	New Zealand
21897	71	15			In addition	Thanks.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
14851	71	23			Reference for tropical settings for reducing deforestation	Noted. Will revise in SOD.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
21899	71	27		37	in Indonesia, there are several succses story for example in Cidanau watershed, in lampung, in lombok etc.PES programs	Thanks.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
3563	71	32			"that" in excess	Thanks.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
29761	71	51			Rights and Responsibilities Initiative (RRI, 2014); Add this article to the reference	Thanks.	RAEHYUN KIM	Institute	Republic of Korea
16649	72	1	72	1	coverage largly omits agricultural options	Noted. Will address in SOD.	Bruce McCarl	Texas A & M University	United States of America
26925	72	8	72	8	Forest Stewardship Council	Thanks	Louis Verchot	International Center for Tropical Agriculture	Colombia
12147	72	8	72	10	Forest certification will foremost lead to mitigation benefit in the long term by different measures for maintaining or increasing carbon stocks, while producing an annual sustained yield of timber that can substitute fossil emissions	Noted.	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
32127	72	19	72	30	Explore the possibility of using the following references to strengthen this paragraph Rossi, V., F. Claeys, D. Bastin, S. Gourlet-Fleury, P. Guizol, R. Eba'a Atyi, D.J. Sonwa, G. Lescuyer, and N. Picard (2017). "Could REDD+ mechanisms induce logging companies to reduce forest degradation in Central Africa?". Journal of Forest Economics 29(Part B): pp.107-117 Kankeu RS, DJ Sonwa, RE Atyi, NMM Nkal (2016). Quantifying post logging biomass loss using satellite images and ground measurements in Southeast Cameroon. Journal of Forestry Research 27 (6), 1415-1426 Nitcheu Tchiadje S, DJ Sonwa, BA Nkongmeneck, L Cerbonney, Kankeu RS (2016). Preliminary estimation of carbon stock in a logging concession with a forest management plan in East Cameroon. Journal of Sustainable Forestry 35 (5), 355-368 Neba S. G., M. Kanninen, R. E. Atyi, D.J. Sonwa, "Assessment and prediction of above-ground biomass in selectively logged forest concessions using field measurements and remote sensing data: Case study in South East Cameroon", Forest Ecology and Management, vol. 329, pp. 1-72, 2014.	Noted and thanks.	Denis Jean Sonwa	CIFOR (Center for International Forestry Reseacrh)	Cameroon
6881	72	20	72	21	Check citations	Thanks.	Valasia Iakovoglou	International Hellenic University	Greece
44939	72	32	72	50	It is argued in the paragraph that there is a large funding gap for forest-based climate change mitigation compared with potentials to meet 1.5 or 2.0 C targets. There is a lack of discussion of what the funding is to be used for, or, in other words, who are to receive funding? Experiences with REDD+ shows that peasants and others often are expected to accept restrictions in their resource uses for modest livelihood purposes without compensation. This provides climate injustice, and it spurs resistance. These are problems that should be addressed here as well as other places in the chapter.	Noted. Will increase discussion of distributional impacts in SOD.	Hanne Svarstad	OsloMet - Oslo Metropolitan University	Norway
26927	72	37	72	38	This is certainly one of the constraints. There are also issues with path dependency and institutional stickiness (Korhonen-Kurki, 2018, Climate Policy)	Noted.	Louis Verchot	International Center for Tropical Agriculture	Colombia
11315	72	43	72	45	How significance is Carbon sequestration of up to 5.8 GtCO2/year??	Thanks. Will clarify this as a proportion of total mitigation in SOD.	Mahmood Riyaz	Maldivian Coral Reef Society	Maldives

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
6883	72	45	72	46	Is there research related to Mediterranenan areas?	Noted. The Griscom and Busch studies are global, although Busch is only pan tropics. Griscom includes all regions.	Valasia Iakovoglou	International Hellenic University	Greece
9919	72	46	72	48	Some consitency is needed. This sentence is a call for more funding for REDD+ while page 71 says the evidence on its effectiveness is mixed and page 33-35 paint it as a total failure.	Noted. Not clear that the earlier discussion implied it was a total failure, so will improve that discussion in SOD. SOD also will include improved assessment.	Valentin Bellassen	INRAE	France
9857	72	52	73	2	Many repetitions of expression "thus far"	Noted and thanks.	Jeanne Bormann	Ministry of agriculture	Luxembourg
46899	72	32	74	43	This section more or less exclusively is on forst policies and actions. I think it should be broadened to all land use activities. Otherwise, you may eventually explain and justify the forestry focus in the introductory section.	Thanks. Will improve for SOD.	Martin Schönhart	University of Natural Resources and Life Sciences, Vienna	Austria
16611	72	1	75	####	coverage largly omits agricultural options	Thanks. Will improve for SOD.	Bruce McCarl	Texas A & M University	United States of America
16599	72		75	####	coverage largly omits agricultural options	Thanks. Will improve for SOD.	Bruce McCarl	Texas A & M University	United States of America
22409	72	17		17	... When adjusted for avoiding double counting	thanks.	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
29543	72	46			Busch et al., 2019; Check year of issue	Noted	RAEHYUN KIM	Institute	Republic of Korea
26929	73	4	73	8	I am not sure why you say significant investments have been made, these figures are less than 1% of what is needed as indicated a few paragraphs previously	Thanks. Good point. Language will be improved in SOD.	Louis Verchot	International Center for Tropical Agriculture	Colombia
32129	73	4	73	16	The reader will be expecting this paragraph to provide funding distribution between the continent. What amount are been disbursed in Africa and more specifically to the countries of the Congo Basin	Thanks and noted. Not clear we can provide full regional distribution of funds applied by region to date, however, will include regional funding needs in SOD through expanded regional discussion.	Denis Jean Sonwa	CIFOR (Center for International Forestry Reseacrh)	Cameroon
44941	73	4	73	16	There is a need to ballance the text more, by also referring to studies that question the assessed mitigation effects of REDD+ (see comment no. 1 above).	Noted. Will include in assessment in SOD.	Hanne Svarstad	OsloMet - Oslo Metropolitan University	Norway
27367	73	25	73	33	references to be assessed here also are: 10.1111/gcbb.12643, 10.1038/s41467-018-06175-4, 10.1088/1748-9326/aaac88, . Another review that needs reference is this one: 10.5849/jof.14-016	Thanks.	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
27371	73	25	73	41	A key issue, in direct consequence of the IPCC 1.5 report, is that the timing of emissions becomes crucial. Early-result strategies need to be favoured. This key dimension of the debate needs to be reflected in the AR6 ch11. See 10.1016/j.biombioe.2018.12.019, 10.1111/gcbb.12327	Noted. Timing will be addressed in SOD.	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
12145	73	25	73	53	Please consider to widen out the perspective to also include how an increasing amount of biomass energy derived from wood and agricultural products influences the carbon budget and in relation to the short and long carbon cycle. In this context it might also be useful to relate to article 2 of the climate convention (stabilisation of GHG consentration in the atmosphere) and the long term goal of the Paris Agreement (achieve a balance between anthropogenic emission by sources and removals by sinks by the second half of the century).	Thanks. Biomass discussion will be expanded in SOD.	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
26931	73	25	73	53	This is more of a literature review than an assessment. Can you draw a conclusion from the literature with uncertainty language? Under what conditions does wood biomass contribute to reduced emissions and under what conditions does it icrease emissions? Make the message more policy relevant	Noted. Will include broader assessment in SOD.	Louis Verchot	International Center for Tropical Agriculture	Colombia
20673	73	29	73	33	Besides the points mentioned, there are some more critical aspects which affects the climate neutrality of biomass: (i) The location the biomass is produced on and its local carbon characteristics, (ii) The time horizon over which biomass is produced, since GHG payback periods are rarely lower than 10-20 years, (iii) Broader land-use and land-zoning policies which would reduce the conversion of lands with high LUC emissions, (iv) Ensuring the use of high yielding energy crops. Daioglou, V., Doelman, J. C., Wicke, B., Faaij, A., & van Vuuren, D. P. (2019). Integrated assessment of biomass supply and demand in climate change mitigation scenarios. Global environmental change, 54, 88-101. Daioglou, V., Doelman, J. C., Stehfest, E., Müller, C., Wicke, B., Faaij, A., & van Vuuren, D. P. (2017). Greenhouse gas emission curves for advanced biofuel supply chains. Nature Climate Change, 7(12), 920-924. Hanssen, S. V., Daioglou, Steinmann, Z. J., Doelman, D.P., van Vuuren, M. Huigbrechts, (under review). The climate change mitigation potential of bioenergy with carbon capture and storage. Elshout, P. M. F., Van Zelm, R., Balkovic, J., Obersteiner, M., Schmid, E., Skalsky, R., ... & Huijbregts, M. A. J. (2015). Greenhouse gas payback times for crop-based biofuels. Nature Climate Change, 5(6), 604-610.	Noted. Will expand and improve discussion in SOD.	Vassilis Daioglou	Copernicus Institute of Sustainable Development	Netherlands

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
27369	73	31	73	33	A caveat is warranted here, as the incentives to create bioenergy plantation is to be seen in the context of land competition (see SRCCL).	Noted. Will expand and improve discussion in SOD, including tradeoffs..	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
12279	73	35	73	41	This statement contradicts with the BECCS stated above. Recent wildfires in Australia and USA and the extent of their after effects and strategies required to prevent wildfires in general should be pointed out	Noted.	Mohammad Ibrahim Khalil	University College Dublin	Ireland
46683	73	35	73	41	The issue of timescale must also be mentioned here: immediate emissions due to wood burning are not immediately compensated by the slow carbon uptake by growing wood. The scientific basis for this can be found, e.g., in Searchinger et al. (2018) “Europe’s renewable energy directive poised to harm global forests,” Nature Communications 9:3741 https://www.nature.com/articles/s41467-018-06175-4 and references therein.	Noted. Other comments have also pointed out and timescale will be addressed in SOD.	Jean-Pascal van Ypersele	Université catholique de Louvain	Belgium
44651	73	43	73	47	Again, even in AR5, BECCS is not the only driver for bioenergy. If you put tight constraints on CCS in AR5 scenarios, bioenergy will shift to other sectors in many models (see, for example: https://iopscience.iop.org/article/10.1088/1748-9326/aaaa02/meta). This should be checked again for more recent scenarios (https://link.springer.com/article/10.1007/s10584-018-2226-y)	Thanks. Will expand and improve discussion on biomass in SOD.	Oliver Geden	German Institute for International and Security Affairs	Germany
14853	73	9			hectares of forests that have been included in REDD or REDD +	Thanks. Will review data to see if we can summarize this for SOD.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
20195	73	18		23	seems to be out of place	Noted.	Henry Neufeldt	UNEP DTU Partnership	Denmark
14855	73	26			biomass energy derived from wood and agricultural products and byproducts	Noted	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
20197	73	29		33	It would be important to briefly lay out the underlying model assumptions and how forest investments are modeled differently	Noted. Will not be space to include a conceptual model but will provide additional citations on that topic.	Henry Neufeldt	UNEP DTU Partnership	Denmark
29541	73	29			Buchholtz et al., 2016; Add this article to the reference	Noted. Thanks	RAEHYUN KIM	Institute	Republic of Korea
29681	73	29			Khanna et al. (2017); Add this article to the reference	Noted. Thanks	RAEHYUN KIM	Institute	Republic of Korea
29591	73	37			Favero et al. (2020); Add this article to the reference	Noted. Thanks	RAEHYUN KIM	Institute	Republic of Korea
29589	73	47			Favero and Mendelsohn, 2014; Add this article to the reference	Noted. Thanks	RAEHYUN KIM	Institute	Republic of Korea
29533	73	48			Baker et al. (2019); Add this article to the reference	Noted. Thanks	RAEHYUN KIM	Institute	Republic of Korea
20199	73	49		53	What about all the other ecosystem services provided by land? Carbon sequestration in forests should never be an end in itself to avoid creating negative externalities elsewhere (eg food security, water security, biodiversity, etc). In WG2 we call this maladaptation and the topic is widely covered in the nexus literature	Noted. Will include additional discussion about SDG and other ecosystem services in SOD.	Henry Neufeldt	UNEP DTU Partnership	Denmark
14857	74	9	74	10	zero emissions from anthropogenic biomass burning, as forest biomass burning due to natural causes are inevitable.	Noted. Language will be improved in SOD	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
27859	74	9	74	10	"It was assumed … from biomass burning" should be removed. No reference to this assumption is found in the New York Declaration of Forests.	Noted. Language will be improved in SOD	Toshimasa Masuyama	International Renewable Energy Agency	Germany
12181	74	21	74	24	This is an extremely important message to policy makers. Please keep and possibly give a more prominent place.	Noted	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
596	74	26	74	26	The term "intact forest" should be used with care as it is ofter equated to "primary forest". The intactness refers mostly to the size of a forest block and its distance to a man-made element, mostly roads, but fires if they are considered to be caused by man. We had this problem in Canada with intact forests as our natural forest fires were considered to be of anthropic origin, leading to a dramatic reported decrease in our intact forest area in heavy fire years. Also, it makes no claims as to the nature of the forest (e.g. primary or secondary regrowth) as it is drawn from remote sensing analysis. Maybe some caveats would be needed here regarding this use of intact forest.	Noted. Thanks.	Pierre Bernier	Natural Resources Canada	Canada
32131	74	26	74	43	On this section on “Monitoring and Verification”, please (1)consider the MRV process at different scales (National, Provincial, local) in tropical countries. (2)See the following references: Kankeu RS, Sonwa DJ (2017) Utilisation des UAV pour le suivi de la déforestation et de la dégradation des forêts dans le bassin du Congo : état des lieux et analyse comparative avec les images satellite de haute résolution. Revue Internationale de Géomatique, Aménagement et Gestion des Ressource. Vol 1. Pp 103-123. Using Local Capacity To Assess Carbon Stocks In Two Community Forest In South-East Cameroon https://www.tandfonline.com/doi/abs/10.1080/10549811.2019.1618716?journalCode=wjsf20 Governing knowledge transfer for deforestation monitoring: Insights from REDD+ projects in the Congo Basin region https://linkinghub.elsevier.com/retrieve/pii/S138993411830128X	Thanks. Scale issue will be addressed in SOD.	Denis Jean Sonwa	CIFOR (Center for International Forestry Reseacrh)	Cameroon
5081	74	28	74	28	Hansen et al. (2013)….not cited in references	accept, editorial	Sayed Masoud Mostafavi Darani	Iran Meteorological Organization	Iran

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
12179	74	36	74	43	This point on the importance of transparency deserves more attention and importance. Important to keep and possibly expand, including language on the importance of publicly available data for policy develpment and public discussion on (sustainable) land use and forest policies.	accept, will take this into account	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
17313	74	39	74	43	Data from most European states' national forest inventories are avsailable through ENFIN (European National Forest Inventory Network, http://www.enfin.info/) in comparable ways to Candian or USA data.	accept, will take this into account	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany
22201	74	54	74	54	Missing space after the word "results"	Editorial. Copyedit to be completed prior publication.	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
29731	74	6			New York Declaration of Forests, 2014; Add this article to the reference	accept, editorial	RAEHYUN KIM	Institute	Republic of Korea
35145	74	11			GtCO2e instead of GtCO2eq for consistency	accept, editorial	Happiness Nnko	The University of Dodoma	United Republic of Tanzania
20201	74	19		24	While the pressure came from environmental and civil society groups, it was the government enforcing the forest code that led to the change in deforestation.	accept, will take this into account	Henry Neufeldt	UNEP DTU Partnership	Denmark
3565	74	28			30 m data. What is m?	accept, editorial	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
21901	74	36		43	I think several country already have inventory of forest data meybe can be adopted form them	accept, will take this into account	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
3567	74	49		52	The sentence is too long. Put a dot after "incertain. It depends on…	Editorial. Copyedit to be completed prior publication.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
22203	75	8	75	8	Space between "2" and "C"	Editorial. Copyedit to be completed prior publication.	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
12149	75	8	75	10	According to the SRCCL , please consider to also include bioenergy without CCS, for instance like this: "..avoided deforestation, bioenergy and Biomass Energy with Carbon Capture and Storage (BECCS)"	accept, will take this into account	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
10509	75	8	75	15	I don't know how many times I've read this in this chapter - it's always written in a highly generic term and simply raises the bogey man of "BECCS could increase rather than decrease emissions" but without any actual assessment and judgement on the outcome. As a result, this sort of text can only confuse readers and create inconsistency across the report. Please ensure that this chapter conducts an actual assessment of the scale and limits of how much biomass can and can't be produced, and under what assumptions. Say this once, clearly, and then refer back to it and pass it on to other chapters. Don't repeat the same partial commentary in lieu of doing an actual assessment.	accept, will take this into account	Andy Reisinger	NZAGRC	New Zealand
18441	75	10	75	10	in this chapter, BECCS has been mentioned several times. But in some places, it looks like the BECCS is mentioned the first time. It needs to enhance the integration of the chapter.	accept, will take this into account	Chang Shiyan	Tsinghua University	China
44653	75	10	75	10	Avoided deforestation is not CO2 removal	accept, will take this into account	Oliver Geden	German Institute for International and Security Affairs	Germany
20675	75	13	75	15	There is a paper under review which can be cited to support this claim (which currentyl lacks citation) Hanssen, S. V., Daioglou, Steinmann, Z. J., Doelman, D.P., van Vuuren, M. Huigbrechts, (under review). The climate change mitigation potential of bioenergy with carbon capture and storage.	accept, will take this into account	Vassilis Daioglou	Copernicus Institute of Sustainable Development	Netherlands
17315	75	18	75	19	Please speciy what you mean with "inputs" in the sentence (middle column, base): "Increased inputs for energy crops and forests may cause land and water pollution". If you refer to fertilizers, please check whether fertilizers play a significant role in forests in the modelling exercises etc. analysed here.	accept, will take this into account	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany
30901	75	18	75	20	It could be more likely that the problems and contraints for BECCS are of a non-technological nature (CCS components are technologically mature), e.g. supply-chain, sustainability, lack of policies/regulations to prevent unsustainable BECCS, lack of financial incentives for CDR, etc.	accept, will take this into account	Jasmin Kemper	IEA Greenhouse Gas R&D Programme (IEAGHG)	United Kingdom (of Great Britain and Northern Ireland)
29021	75	18	75	21	Source for Table 7.11?	Editorial. Copyedit to be completed prior publication.	Marissa Malahayati	National Institute for Environmental Studies	Japan
18657	75	18	76	2	it seems there is no reference in the text to table 7.11 or table 7.12	Editorial. Copyedit to be completed prior publication.	Charlotte Janssens	KU Leuven	Belgium
19813	75	20	77	30	As to potential socio-economic constraints fe Gingrich, Simone, Karl-Heinz Erb, Fridolin Krausmann, Veronika Gaube, Helmut Haberl, 2007.Long-term dynamics of terrestrial carbon stocks in Austria. A comprehensive assessment of the time period from 1830 to 2000. Regional Environmental Change 7(1), 37-47. doi: 10.1007/s10113-007-0024-6	thank you for the reference	Michael Englisch	Austrian Research Centre for Forests	Austria

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
21903	75	6			Kartha, 2018	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
35147	75	8			2°C instead of 2 °C	Editorial. Copyedit to be completed prior publication.	Happiness Nnko	The University of Dodoma	United Republic of Tanzania
14859	75	10			The full form of BECCS is should be mentioned earlier in the initial place it self	Editorial. Copyedit to be completed prior publication.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
35149	75	12			1.5°C instead of 1.5 °C	Editorial. Copyedit to be completed prior publication.	Happiness Nnko	The University of Dodoma	United Republic of Tanzania
3569	75	18			in table 7.11, please to explain the meaning of NPP	accept, editorial	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
14861	75	18			column two; last line, ---------forest may cause land ,air and water pollution. (air pollution due to increased emission of GHG and NH3/Nox from fertiliser application and other emissions from application of pesticides if any.	unclear question	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
21905	75	18			Kartha, 2018	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
28091	76	1	76	1	improve the readiness of the table	Editorial. Copyedit to be completed prior publication.	Alix Frank Rodrigue Idohou	National University of Agriculture	Benin
17317	76	1	76	2	Please consider reworking the table. The source cited here uses different definitions for reforestation and afforestation as are used earlier in the chapter (afforestation is missing in the table entirely, seems to be subsumed in "restoration")	Noted. The section will be revised and we will evaluate if we will the table and how rework. it	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany
30903	76	1	76	2	This table delivers a very incomplete picture, as only 3 SDGs are mapped. E.g. one of the biggest benefits of BECCS is the co-production of low-carbon energy (if we see the CO2 removal and storage as the main service), so there would be synergies with SDG7 and as BECCS has a strong technology component also with SDG9.	Noted. The section will be revised and we will evaluate if we will the table and how rework it.	Jasmin Kemper	IEA Greenhouse Gas R&D Programme (IEAGHG)	United Kingdom (of Great Britain and Northern Ireland)
29023	76	1	76	3	Source for Table 7.12?	Editorial. Copyedit to be completed prior publication.	Marissa Malahayati	National Institute for Environmental Studies	Japan
18659	76	2	76	2	Dooley and Kartha (2018) state that they give only "a provisional assessment of the extent to which they (negative emission technologies) are in conflict with sustainable development goals related to land, food and climate." A more comprehensive overview of the literature could be given in this section on the trade-offs between NETs and SDGs (i.e. more than one review study). This would be especially relevant for SDG2 and SDG15 as food and biodiversity effects are put forward as key objectives of chapter 7 (p8 line 5-6).	Noted. The section will be revised and will refer to the substantial information on SDGs in previous IPCC reports.	Charlotte Janssens	KU Leuven	Belgium
15807	76	10	76	13	Other countries like UK and Brazil are following Australia's work to diminish emissions from livestock and have vowed to reach "carbon neutral beef" production: In the UK, the NFU states "The NFU has reiterated that improvements in productivity, carbon capture and renewable energy production are the most effective ways to reach agricultural net zero targets, as part of its ambition to reach net zero by 2040." reference: https://www.nfuonline.com/news/latest-news/nfu-reiterates-its-net-zero-aims for-agriculture. New peer reviewed research UK and Australia, as well in Brazil, Argentina, Colombia show that migrating to carbon neutral meat production is a feasible climate change mitigation action. In Brazil, EMBRAPA has published studies which support the viability of carbon neutral beef: "http://www.alice.cnptia.embrapa.br/alice/handle/doc/1118359" and also this article: https://www.alice.cnptia.embrapa.br/bitstream/doc/1118439/1/Economicanalysisof.pdf and this third article https://link.springer.com/article/10.1007/s10457-019-00460-x In USA, studies are being done in this sense, for example by Yale "Silvopastoral systems and climate change mitigation in Latin America" by Montagnini, F, Ibrahim, M, Murgueitio, E. Restrepo at https://pdfs.semanticscholar.org/018b/34c7da1176d1e9134edd1aabef2a0ab98a7f.pdf In Colombia: Charry, A., Narjes, M., Enciso, K. et al. Sustainable intensification of beef production in Colombia—Chances for product differentiation and price premiums. Agric Econ 7, 22 (2019). https://doi.org/10.1186/s40100-019-0143-7 IPCC should support these meat production mitigation initiatives, because they might offer carbon neutral protein solutions to humankind.	Noted, thank you for the references.	EDUARDO PEDRO FRACASSI	ITBA Instituto Tecnologico de Buenos Aires	Argentina
16651	76	12	76	12	I really don't think one could make meat production carbon nuetral by "manage vegetation for the mutual benefit of production". It would take too much land	Noted, the text will be revised.	Bruce McCarl	Texas A & M University	United States of America
30631	76	13	76	16	If paired with reduced demand for livestock products from importing countries.	Noted, the text will be revised.	Raychel Santo	Johns Hopkins Center for a Livable Future, Bloomberg School of Public Health	United States of America
26933	76	21	76	25	Notwithstanding, most non-Annex I countries have increased their ability to monitor and report deforestation emissions (Romijn et al., 2015, For. Ecol. & Mgnt.) A new analysis is on its way from Martin Herold's lab at Wageningen and should be available for the next review cycle of this report.	Noted, thank you for the reference and the information about a new study.	Louis Verchot	International Center for Tropical Agriculture	Colombia

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
46371	76		76		In Table 7.12, the negative trade-offs of avoided afforestation (e.g. with REDD+) were not acknowledged by the author. This is inconsistent with the text before that acknowledges negative impacts of REDD+ measures. For example, REDD+ can impact negatively to Zero Hunger (SDG1) if people are not allowed to live in the protected areas. An article evaluating the opportunities and challenges of REDD+ for achieving effective, efficient and equitableoutcomes and co-benefits is "Challenges and opportunities for REDD+: A reality check from perspectives of effectiveness, efficiency and equity" Pasgaard et al. (2016). The table should be adapted from Dooley and Kartha (2018) but completed with other information on trade-offs.	Noted. The section will be revised and we will evaluate if we will the table and how rework it.	Diana Feliciano	University of Aberdeen	United Kingdom (of Great Britain and Northern Ireland)
16601	76	12			I really don't think one could make meat production carbon nuetral by "manage vegetation for the mutual benefit of production". It would take too much land	Noted, the text will be revised.	Bruce McCarl	Texas A & M University	United States of America
3571	76	1			in table 7.12, please to explain " ag."	Editorial. Copyedit to be completed prior publication.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
14863	76	1			(±) referes to neutral??? , Should be mentioned as notes below the table	Noted. The section will be revised and we will evaluate if we will the table and how rework it.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
14865	76	1			Column two : (partial use of residues for soil incorporation along with use of residues for bioenergy can be a win win situation) should also be included	Noted. The section will be revised and we will evaluate if we will the table and how rework it.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
20203	76	1			Potentially combine the table with SRCCL and IPBES. Potentially move this to the section on SDGs.	Noted. The section will be revised and we will evaluate if we will the table and how rework it.	Henry Neufeldt	UNEP DTU Partnership	Denmark
21907	76	1			Kartha, 2018	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21909	76	1			plus and minus in the table should be explain in the note after table	Noted. The section will be revised and we will evaluate if we will the table and how rework it.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21911	76	6			land use and land use change (LULUC)	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
35151	76	8			remove space >GtCO2 instead of Gt CO2	Editorial. Copyedit to be completed prior publication.	Happiness Nnko	The University of Dodoma	United Republic of Tanzania
21913	76	13			here are large countries with export-oriented livestock industries ? Please mention the country such as:….	Noted.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
20205	76	29			It's much more about tenure rights and ownership	Noted, tenure rights and ownership are indeed relevant aspects and will be discussed in different sections and chapters. We will included the cross references.	Henry Neufeldt	UNEP DTU Partnership	Denmark
21915	76	39			greenhouse gas (GHG)	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21917	76	49			Zhu et al. 2018	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
44655	77	1	77	8	It would be good to assess to role of forestry offsets in the vastly increasing number of 'climate neutrality' pledges by companies (not sure if there's literature yet, but it should emerge in time)	Noted, the inclusion will be dependent on the available literature.	Oliver Geden	German Institute for International and Security Affairs	Germany
16653	77	4	77	4	there is a lot wrong with the statment "Despite their comparatively small volume, voluntary offsets have an outsized impact on compliance markets and on emission reductions activities in general with the value of the forestry and land use offsets market more than triple that of the renewables market, corresponding to 46% of the total value of the voluntary carbon markets in 2016 (Hamrick and Gallant, 2017)." as it largely ignres non additional contributions. this was explored in a recent phd thesis Minglu Wang, Three Essays on Economic and Environmental Analysis of Climate Change Adaptation and Mitigation in the U.S. Agricultural Sector, Texas A&M University, May, 2020 and is under submission	Noted, the inclusion will be dependent on the available literature.	Bruce McCarl	Texas A & M University	United States of America
26935	77	11	77	15	Commitments are easy, the question that would be nice to answer is whether there is any evidence of the effectiveness of implementation or whether there are outcomes of private sector efforts to curb deforestation	Noted, the inclusion will be dependent on the available literature.	Louis Verchot	International Center for Tropical Agriculture	Colombia
26937	77	25	77	26	Tempearate forest regrowth does not provide climate mitigation benefits, albedo effects swamp carbon effects at high and intermediate latitudes. There is a lot of literature on this (see e.g. Scott et al., 2018 Nat. Comm.)	Biophysical effects as albedo will be also include.	Louis Verchot	International Center for Tropical Agriculture	Colombia
17319	77	26	77	28	Please check: why do you state that forest fires lead to a loss in forest area? Depending on fire severity, carbon is lost from litter and foliage, but standing trees may survive, or if killed, stands can regenerate and thus the area will not be lost, just stocks of carbon be released.	Agreed, the text will be revised to consider these aspects.	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany
12281	77	32	77	37	On the contrary, absorption of gases emitting from agriculture, a recent thought is to include a properly design agro-forestry system to reduce particularly reactive nitrogen (Nr) emission.	Noted, but the consideration will be dependent on the available literature.	Mohammad Ibrahim Khalil	University College Dublin	Ireland
13493	77	32	77	37	The same paragrah appears p80	Editorial. The repetition was a mistake.	Sophie Szopa	Commissariat à l'Energie Atomique et aux Energies Alternatives	France

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
17321	77	32	77	37	Delete this paragraph. It is based on a single reference for Norvegian conditions and in no way representative of the afforestation conditions in the rest of the world. If you want to include a paragraph on the effects of afforestation on soil chemistry and groundwater, more (and other) references need to studied and included here.	Noted, the text will be revised to consider additional references.	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany
9921	77	42	77	45	Some consistency is needed. Lines 20-30 dismiss uncertainty on the future of the terrestrial sink by highlighting Kim et al (2017) and stating that it replaces previous model cross-comparison which were indeed uncertain (eg. Friedlingstein et al 2015). And here the future of the terrestrial sink is uncertain again. So, uncertain or not?	Both statements are not in contradiction but the text will be revised to make it clearer.	Valentin Bellassen	INRAE	France
13155	77	42	77	47	In addition, Hubau et al. (2020) found that the uptake of carbon in tropical forests (Africa & Amazonia) already peaked in the 1990s and continue to decline.	Noted. Thanks for the reference.	Johan de Jong	Wageningen University & Research	Netherlands
12183	77	48	77	49	The timescale "many decades" seems irrelevant for long term climate goals (stabilisation accoring to article 2 of the Climate Convention or second half of the century in the Paris-agreement).	Rejected. Many decades encompass the second half of this century.	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
45085	77	53	77	55	Such references as "Socially optimal forest management and biodiversity conservation in temperate forests under climate change" from the year 2020 may be beneficial to be reviewed in this section in support of the related statements. At the same time, the same paragraph appears to repeat also on page 80 lines 27 and 33 that may be streamlined as relevant	Editorial. The repetition was a mistake.	Siir Kilkis	The Scientific and Technological Research Council of Turkey	Turkey
3575	77	32	78	4	the paragraph is identical to the & page 79 lines 6 to 33	Editorial. The repetition was a mistake.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
12063	77	32	78	4	This is almost the same paragraph as page 80 line 6-33	Editorial. The repetition was a mistake.	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
43967	77	53	78	4	The role of species and species composition, considering plant and animal species should be exemplified or research gaps identified, certainly building on regional considerations.	Rejected, although relevant, these topics can not be expanded due to space limitations. IPBES report will mentioned.	Hans Poertner and Elvira Poloczanska	Alfred-Wegener-Institut	Germany
16603	77	4	#REF!	####	there is a lot wrong with the statment "Despite their comparatively small volume, voluntary offsets have an outsized impact on compliance markets and on emission reductions activities in general with the value of the forestry and land use offsets market more than triple that of the renewables market, corresponding to 46% of the total value of the voluntary carbon markets in 2016 (Hamrick and Gallant, 2017)." as it largely ignres non additional contributions. this was explored in a recent phd thesis Minglu Wang, Three Essays on Economic and Environmental Analysis of Climate Change Adaptation and Mitigation in the U.S. Agricultural Sector, Texas A&M University, May, 2020 and is under submission	Noted, the inclusion will be dependent on the available literature.	Bruce McCarl	Texas A & M University	United States of America
20207	77	4		8	Check the Ecosystem Marketplace State of the forest carbon market reports	Noted, thank you for the reference.	Henry Neufeldt	UNEP DTU Partnership	Denmark
3573	77	10		18	the paragraph is very close to the meaning of the paragraph page 79, lines 23 to 33	Thank you, the text will be revised.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
14867	77	43			impacts of severe droughts impacts- the second impact should be deleted	Editorial. Copyedit to be completed prior publication.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
12151	78	2	78	4	Please give some examples of forest management strategies in this respect. How does this relate to line 47-51 on page 3?"Optimal land management that yields the largest sustained mitigation benefit in the long term will ideally maintain or increase carbon stocks, while producing an annual sustained yield of food, feed, timber, fiber and biomass feedstocks. In natural high carbon lands, protection of carbon stocks and biodiversity will be of most benefit" (high confidence)."	Forest management strategies will be considered in the Mitigation options section. We will consider a cross-reference her.	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
25103	78	15	78	19	Delete "The role of forests … However," as this is all a repetition	Editorial. The repetition was a mistake.	Eleni Kaditi	Organization of the Petroleum Exporting Countries (OPEC)	Austria
26939	78	15	78	20	This section is word for word a repeat of the section on page 72 lines 33-38	Editorial. The repetition was a mistake.	Louis Verchot	International Center for Tropical Agriculture	Colombia
25787	78	19	78	25	Repetition from p72 line 50.	Editorial. The repetition was a mistake.	Helen Hughes	University of Edinburgh	United Kingdom (of Great Britain and Northern Ireland)
29961	78	21	78	22	Delete 'see' and 'for a review on California's cap-and-trade program.	Editorial. Copyedit to be completed prior publication.	RAEHYUN KIM	Institute	Republic of Korea
32133	78	22	78	23	Explore the following references to strengthen this statement: (1) Book ("Transforming REDD+: Lessons and new directions" https://www.cifor.org/library/7045/) (2) Chapter "Pathway to impact: Is REDD+ a viable theory of change?" (https://www.cifor.org/library/7062)	Thank you for the references. We will check them.	Denis Jean Sonwa	CIFOR (Center for International Forestry Reseacrh)	Cameroon
22205	78	27	78	28	Space between "2" and "C"	Editorial. Copyedit to be completed prior publication.	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
25789	78	27	78	32	Repetition from p73 line 18.	Editorial. The repetition was a mistake.	Helen Hughes	University of Edinburgh	United Kingdom (of Great Britain and Northern Ireland)
32135	78	34	78	53	In this section on “Socio-economic barriers and opportunities”, is good to read about the meat industry. Is good to have information on livestock industry… Can some information be also provided on chocolate industry?	Meat sector is mentioned because the substantial impacts on emissions.	Denis Jean Sonwa	CIFOR (Center for International Forestry Reseacrh)	Cameroon
30633	78	46	78	47	It is highly debated whether red meat could ever attain a "carbon neutral" status - especially if considering methane and not just CO2	Noted.The reference considered not possible without significant investments.	Raychel Santo	Johns Hopkins Center for a Livable Future, Bloomberg School of Public Health	United States of America
14869	78	46	78	51	repitition, same as second last para on page 76	Editorial. The repetition was a mistake.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
9859	78	46	78	53	The same paragraph appears on page 76.	Editorial. The repetition was a mistake.	Jeanne Bormann	Ministry of agriculture	Luxembourg
12161	78	46	78	53	Repetition from page 76 line 10-16	Editorial. The repetition was a mistake.	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
25791	78	46	78	53	Repetition from p76 line 11.	Editorial. The repetition was a mistake.	Helen Hughes	University of Edinburgh	United Kingdom (of Great Britain and Northern Ireland)
12061	78	46	78	54	This is almost the same paragraph as page 76 line 10-16	Editorial. The repetition was a mistake.	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
19721	78	53	78	53	the para above already mentioned in p. 78, line 53	Editorial. The repetition was a mistake.	Mochamad Indrawan	Research Center for Climate Change - Universitas Indonesia (RCCC-UI)	Indonesia
26941	78	34	79	33	Many of the conclusions from the SSPs have already been presented in section 7.6. Consolidate the text to avoid repetition.	A better connection with sections will be considered.	Louis Verchot	International Center for Tropical Agriculture	Colombia
12283	78		83		Seems duplication, need to avoid and remove sentences where applicable.	Editorial. Copyedit to be completed prior publication.	Mohammad Ibrahim Khalil	University College Dublin	Ireland
21919	78	1		2	positive Exampel of effects of diversity on ecosystem functioning???	We considered the inclusion of some references with examples.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
20209	78	22		25	Explain why that is. An important factor is lack of local capacity, which leads to much higher investment risks (and costs). Another are the underlying drivers of deforestation, which generally lie outside the forest and are driven by global supply chains.	Noted, will connected with the section on drivers.	Henry Neufeldt	UNEP DTU Partnership	Denmark
3577	78	35		41	the paragraph repeats the & page 76 lines 4 to 8	Editorial. The repetition was a mistake.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l’environnement	France
22411	78	37		37	... Integrated Assessment Models (IAMs)	Editorial. Copyedit to be completed prior publication.	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
21921	78	44			greenhouse gas? GHG	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
3579	78	46		51	the paragraph repeats the & page 76 lines 10 to 14	Editorial. The repetition was a mistake.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l’environnement	France
21923	78	51			In many of these places, such as…..	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
19717	79	1	79	5	while on discussion of the functions, services, and benefits of biodiversity there c0uld also discussion of value adding	Comment is not clear.	Mochamad Indrawan	Research Center for Climate Change - Universitas Indonesia (RCCC-UI)	Indonesia
17323	79	1	79	10	Please rephrase: insufficient capacities are no potential.	Comment is not clear.	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
32137	79	1	79	10	To strengthen this first paragraph of the section on “Institutional barriers and opportunities”, please explore how to use the following references related to the weakness of the stakeholders and the synergies between Climate change response and Biodiversity conservation (Line 9&10): Tiani AM, MY Bele, DJ Sonwa (2015) What are we talking about? The state of perceptions and knowledge on REDD+ and adaptation to climate change in Central Africa. Climate and Development 7 (4), 310-321 Chia EL, OA Somorin, DJ Sonwa, YM Bele, MA Tiani (2015) Forest–climate nexus: linking adaptation and mitigation in Cameroon's climate policy process. Climate and Development 7 (1), 85-96 Kemeuze VA, Mapongmetsem PM, Sonwa DJ, Fongnzossie E, Nkongmeneck BA. Plant diversity and carbon stock in sacred groves of semi-arid areas of Cameroon: case study of Mandara mountains. International Journal of Environment, 2015; 4(2):308- 318. Fongnzossie EF, DJ Sonwa, V Kemeuze, P Auzel, BA Nkongmeneck (2014) Above-ground carbon assessment in the Kom-Mengamé forest conservation complex, South Cameroon: Exploring the potential of managing forests for biodiversity and carbon. Natural Resources Forum 38 (3), 220-232 Sonwa D S, Walker S, Nasi R , Kanninen M, (2011) Potential synergies of the main current forestry efforts and climate change mitigation in central Africa. Sustainability Science. Volume 6, Number 1, 59-67, DOI: 10.1007/s11625-010-0119-8	Thank you, but the report must consider references from different groups and avoid to focus on just one group of authors.	Denis Jean Sonwa	CIFOR (Center for International Forestry Reseacrh)	Cameroon
22207	79	1	79	33	Barriers are not only institutional based but also individual based, mainly those involved in the decision and policy making. Not all individual at all level of govermental levels have similar level of awareness regarding climate cange issues and their possible consequences in future	Noted, but this will be considered in more detail in the policy chapter	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
14871	79	1	79	50	Most of the text is repitition of page 76/ 77 line 25-30	Editorial. The repetition was a mistake.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
44419	79	2	79	2	Despite tradition of the term in some literature, the notion of good governance is morally charged, and not a neutral and scientific notion of governance which, on the other hand, can be qualified by any of its multiple forms. It undergirds a program of bureaucratic and societal reform, and not everyone regards good governance as a self-evident positive contribution to public welfare. This can lead to certain governance arrangements becoming regardes as good in and of themselves rather than as reflections of particular (and contestable) political worldviews. Mitchell, J.K. (2015). Governance of Megacity Disaster Risks: Confronting the Contradictions. In Fra.Paleo, U. (ed.) Risk Governance. The Articulation of Hazard, Politics and Ecology. Dordrecht: Springer. pp. 413-439.	Thank you for the reference, but this concept will be better defined in the specific chapters of the report.	Urbano Fra Paleo	University of Extremadura	Spain
29963	79	2	79	10	I can find same paragraph in line with page 7.76 line 18-26.	Editorial. The repetition was a mistake.	RAEHYUN KIM	Institute	Republic of Korea
46733	79	10	79	10	Please add Mikael Karlsson, Eva Alfredsson & Nils Westling (2020) Climate policy co-benefits: a review, Climate Policy, DOI: 10.1080/14693062.2020.1724070.	Thank you for the reference. We will check it.	Mikael Karlsson	KTH Royal Institute of Technology	Sweden
9861	79	12	79	21	The same paragraph appears on page 76 and 77.	Editorial. The repetition was a mistake.	Jeanne Bormann	Ministry of agriculture	Luxembourg
29965	79	12	79	21	I can find same paragraph in line with from page 7.76 line 28 to page 7.77 line 8.	Editorial. The repetition was a mistake.	RAEHYUN KIM	Institute	Republic of Korea
32139	79	12	79	21	Is good to mention the “Opportunity for political participation of local stakeholders”, but at the same time think also on intermediate actors such as Provincial levels in different tropical countries. REDD+ responses is generally frame at the national level with some pilot activities at the ground level, but for the sustainability of the process, the administrative actors of the provincial and/or district levels will be the one implementing deforestation actions… so it will be good to start think on it now… the multi-level governance this need proper attention.	The inclusion of multi-level governance will be dependent on the literature available.	Denis Jean Sonwa	CIFOR (Center for International Forestry Reseacrh)	Cameroon
44657	79	17	79	33	It would be good to assess to role of forestry offsets in the vastly increasing number of 'climate neutrality' pledges by companies (not sure if there's literature yet, but it should emerge in time)	The inclusion of the topic will be dependent on the literature available.	Oliver Geden	German Institute for International and Security Affairs	Germany
9923	79	18	79	18	"voluntary offsets have an outsized impact on compliance markets". This is meaning to me. I guess you meant something like "AFOLU has an outsized impact in voluntary offsets".	Editorial. Copyedit to be completed prior publication.	Valentin Bellassen	INRAE	France
29967	79	23	79	25	I can find same paragraph in line with page 7.77 line 10-12.	Editorial. The repetition was a mistake.	RAEHYUN KIM	Institute	Republic of Korea
9863	79	23	79	33	The same paragraph appears on page 77.	Editorial. The repetition was a mistake.	Jeanne Bormann	Ministry of agriculture	Luxembourg

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
28731	79	23	79	33	The example of “private commitments to reduce deforestation from supply chains” alone is not enough to support the argument that “the response of the private sector to climate change will be key for setting and achieving the commitments made by Parties to the UNFCCC”. In fact, more than 400 forest carbon project developers have been identified worldwide, with the majority belonging to the private sector, either for-profit organizations or NGOs (Simonet et al., 2018). However, the strategies and behaviors of private sector financing or engagement in REDD+ at the project level remain an important but under-researched area (Dixon and Challies, 2015). At the time of writing, studies that examined such aspects are limited to the case from Indonesia, Europe, and Japan (Dixon and Challies, 2015, Laing et al. 2016; Ehara et al. 2019). Therefore, following sentences can be added: “…on small producers. More than 400 forest carbon project developers have been identified worldwide, with the majority belonging to the private sector, either for-profit organizations or NGOs (Simonet et al., 2018). If more private finance is to be directed toward REDD+, it is necessary for policy-makers and project developers to understand the barriers for private sector participation in REDD+ projects. The barriers commonly identified by the case studies from Indonesia, Europe and Japan are market uncertainty, unclear regulatory frameworks and the unpredictability of the cost-effectiveness in measuring, reporting and verification of the project’s performance (Challies, 2015, Laing et al. 2016; Ehara et al. 2019). ” Added reference Dixon and Challies, 2015. Making REDD+ pay: shifting rationales and tactics of private finance and the governance of avoided deforestation in Indonesia. Asia Pac. Viewp. 56, 6–20. https://doi.org/10.1111/apv.12085. Laing et al. 2016. Understanding the demand for REDD+ credits. Environ. Conserv. 43, 389–396. https://doi.org/10.1017/S0376892916000187. Ehara et al. 2019. REDD+ engagement types preferred by Japanese private firms: The challenges and opportunities in relation to private sector participation, For. Policy Econ. 106, 101945. https://doi.org/10.1016/j.forpol.2019.06.002.	Thanks for the references and text but the sentence already recognizes the relevance of the private sector.	Makoto Ehara	Forestry and Forest Products Research Institute	Japan
29969	79	28	79	33	I can find same paragraph in line with page 7.77 line 13-18.	Editorial. The repetition was a mistake.	RAEHYUN KIM	Institute	Republic of Korea
17325	79	35	79	50	Please rework this paragraph. There are more studies than Kim et al. Available in this context and the last sentence is redundant to page 77, lines 28 – 30.	Editorial. The repetition was a mistake.	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany
29971	79	36	79	39	I can find same paragraph in line with page 7.77 line 20-23.	Editorial. The repetition was a mistake.	RAEHYUN KIM	Institute	Republic of Korea
20677	79	42	79	42	Given the recent debate (mostly on social media, and generaly very unsavoury) concerning RCP 8.5, its probably better to not refer to RCP8.5 as "business as usual" but rahter something along the lines of "extreme" or "worst case scenario". I think that is also a more appropriate description.	Agreed, the text will be revised to consider these aspects.	Vassilis Daioglou	Copernicus Institute of Sustainable Development	Netherlands
20213	79	1	80	42	Much of this seems to have been written before. Please check.	Editorial. The repetition was a mistake.	Henry Neufeldt	UNEP DTU Partnership	Denmark
26943	79	35	80	42	There is a lot of repetition from previous sections.	Editorial. The repetition was a mistake.	Louis Verchot	International Center for Tropical Agriculture	Colombia
606	79	52	80	33	Material repeated from p. 77	Editorial. The repetition was a mistake.	Pierre Bernier	Natural Resources Canada	Canada
3581	79	2		21	the paragraphs repeat the & page 76 line 18 to page 77 line	Editorial. The repetition was a mistake.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l’environnement	France
20211	79	7			It might be a good idea to bring all the MRV related pieces together into one.	Thanks for the suggestion. We will check if this is possible during the revision process.	Henry Neufeldt	UNEP DTU Partnership	Denmark
3583	79	36		40	is the same as the beginning of the & page 77 lines 20 to 30	Editorial. The repetition was a mistake.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l’environnement	France
21925	79	43			GHG	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
3585	79	45		50	is the same as the end of the & page 77 lines 20 to 30	Editorial. The repetition was a mistake.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l’environnement	France
21927	79	46		50	why?	Comment is not clear.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
29651	79	52			Houghton and Nassikas (2018); Check year of issue	Editorial. Copyedit to be completed prior publication.	RAEHYUN KIM	Institute	Republic of Korea

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
11317	80	6	80	11	What are the likely impacts of surface water acidification? Why it is important	The point here is to stress potential negative impacts on ecosystems related to afforestation (in this case, decrease of water quality).	Mahmood Riyaz	Maldivian Coral Reef Society	Maldives
29973	80	6	80	33	I can find same paragraphs in line with from page 7.77 line 32 to page 7.78. line 4.	Editorial. The repetition was a mistake.	RAEHYUN KIM	Institute	Republic of Korea
17327	80	6	80	42	delete paragraphs, doubled from page 77.	Editorial. The repetition was a mistake.	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany
12153	80	13	80	16	Repetition form page 77 line 39-42	Editorial. The repetition was a mistake.	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
13233	80	16	80	19	In addition, Hubau et al. (2020) found that the uptake of carbon in tropical forests (Africa & Amazonia) already peaked in the 1990s and continue to decline.	Noted, reference will be checked.	Johan de Jong	Wageningen University & Research	Netherlands
9865	80	27	80	33	The same paragraph appears on page 77 and 78.	Editorial. The repetition was a mistake.	Jeanne Bormann	Ministry of agriculture	Luxembourg
19719	80	27	80	33	Biodiversity may improve resilience to climate change impacts on a) biodiversity itself, as more diverse systems could be more resilient to climate change impacts, and b) ecosystem functioning through the positive relationship between diversity and ecosystem functioning (Hisano et al. 2018). The shift in species/functional diversity and losses in plant species diversity may impair the positive effects of diversity on ecosystem functioning. Forest management strategies based on biodiversity and 32 ecosystems functioning interactions have strong potential for augmenting the effectiveness of the roles of forests in reducing climate change impacts on ecosystem functioning.	Editorial. Copyedit to be completed prior publication.	Mochamad Indrawan	Research Center for Climate Change - Universitas Indonesia (RCCC-UI)	Indonesia
22209	80	27	80	33	Redundant statement from previous section (p.77)	Editorial. The repetition was a mistake.	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
25105	80	27	80	33	Delete "Biodiversity may improve resilience … on ecosystem functioning." as this is all a repetion (please see a few pages earlier in the chapter	Editorial. The repetition was a mistake.	Eleni Kaditi	Organization of the Petroleum Exporting Countries (OPEC)	Austria
27373	80	45	81	40	This passage is redundant with introductory parts of the chapter, needs reconciliation. (Actually, I liked this part better then the one above, but it should not be a matter of taste...)	Suggestion notes. Will reconcile the sections in the SOD	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
43969	80	45	82	27	The sobering summary of IPBES reports with respect to impact of human actions on biodiversity and ecosystems services should be followed by an equally succinct summary of the mitigation and adaptation options that may reverse those devastating trends described especially for the tropics (see also comment on pp. 7 to 9). Coordination with WGII chapters 2, 5 as well as development of a Cross Working Group Box on Biodiversity and ecosystem services should be investigated.	Accept. Will address this issue in the SOD	Hans Poertner and Elvira Poloczanska	Alfred-Wegener-Institut	Germany
46901	80	47	83	23	This part more or less summarizes IPBES with little focus on mitigation. A review of the literature on mitigation trade-offs with ecosystem services, either case studies or global assessments may be helpfull here (e.g. Kirchner et al. Ecological Economics 109, 161–174; Bryan et al. Glob Change Biol 21, 4098-4114	Accepted.Will discuss the mitigation trade-offs with ecosystem services in the SOD. Will also refer to the suggested references	Martin Schönhart	University of Natural Resources and Life Sciences, Vienna	Austria
17331	80	45	84	18	Please check : there are classifications („well established“, „inconclusive“, …) that are not standard IPCC ratings.Please delete, transfer into IPCC vocabulary (if possible) or add a box explaining them.	IPCC and IPBES levels of confidence or Uncertainty categories don't coincide.Hence will delete the references to IPBES Uncertainty categories in the SOD, as suggested by the reviewer	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany
26945	80	45	84	18	This section can be deleted, there is nothing here that has not already been said.	Accept.	Louis Verchot	International Center for Tropical Agriculture	Colombia
21929	80	13			GHG	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21931	80	17			see?i thisk no need use it	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21933	80	23			et al. 2018	Editorial. Copyedit to be completed prior publication.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
3587	80	36		42	is the same as the & page 74, lines 48 to 54	Editorial. The repetition was a mistake.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
5929	80	45			This whole section 7.7.3 relies heavily on IPBES reports. This is not a true asseement of the literature. I suspect the LA has links with IPBES so has a bias and familiarity with that analysis. Other sources should be referenced and included in the discussion.	Suggestion noted. Since IPBES is an intergovernmental agency like IPCC, its assessment reports are given considerable importance. Moreover their global and regional assessment reports are the latest available assessments on biodiversity and ecosystem services and published in 2019, 2018 and 2017. Most of the other literature are dated, Also except for Costanza et al and the IPBES Global and Regional Assessment Reports, the other literature assess ecosystem services at a point of time and don't shed light on the trends in ecosystem services at global or regional levels. Nevertheless as suggested by the reviewer the SOD will cover other literature as well as critically evaluate the reviewed literature.	Ralph Sims	Massey University	New Zealand
10511	80	45			I'm missing a dedicated section on food security here. This is a critical key concern for many decision-makers. What can the assessment in other parts of this chapter tell us about what mitigation options could threaten food security, and what sort of system changes would reduce such risks while allowing enhanced mitigation outcomes within the AFOLU sector? Are there hard limits to scale, how much depends on dietary choices (see the need for an expanded discusion on those options in section 7.5.9)? How much depends on policy design and implementation? E.g. the work by Fujimori et al showed risks from a 'blunt' price application, but what do we know about more nuanced options?	Noted. SOD will include more discussion of interaction	Andy Reisinger	NZAGRC	New Zealand
39799	80	53			you might want to refer to some of Ruddiman's work (e.g. Climatic Change 61: 261–293, 2003) that links human influence on greenhouse gases to the origin of agriculture some 10000 years ago.	Suggestion noted	David Manning	Newcastle University	United Kingdom (of Great Britain and Northern Ireland)
11319	81	1	81	40	why is this whole section is based on a single reference (IPBES 2019) ? Need to add more references and sources of information	Accept. The SOD will also cover other relevant literature in addition to IPBES assessment reports	Mahmood Riyaz	Maldivian Coral Reef Society	Maldives
38739	81	1	81	41	Percentage signs need a space before the start of the next word	Suggestion noted	Adriana Mordente	United Nations Convention to Combat Desertification	Germany
43287	81	13	81	14	note here large changes in land cover--likely for ag; again contrasts with statements earlier (pp 13-18) that seemed to say very little change in ag land has occurred.	Suggestion noted. Will reconcile these statements in the SOD	Deborah Lawrence	University of Virginia	United States of America
27861	81	32	81	35	"large scale bio-fuel plantations" should be either removed or changed to "oil palm plantations". The primary objective of oil palm plantations is to produce edible oil and oil for cosmetics use while the rest can be converted into biodiesel. It is not correct to describe palm oil plantations as bio-fuel plantations. It should also be noted that this is not consistent with the fact explained in line 33 of page 54 of this chapter saying land use change associated with bioenergy represents a very small percentage of overall changes in land use.	Point noted. This statement is taken from the recent IPBES Asia-Pacific Regional Assessment Report on Biodiversity and Ecosystem Services. This statement will be qualified to state that this is most likely accounted by oil palm plantations which are mainly raised for producing edible oils and oils for the cosmetic industry, and the rest for biodiesel production.	Toshimasa Masuyama	International Renewable Energy Agency	Germany
22211	81	39	81	39	Missing space between "1%" and "of the earth's land"	Suggestion noted	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
3589	81	1			space needed between the figures and the "of"	Suggestion noted	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
3591	81	2			idem	Noted	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
21935	81	4			IPBES, 2019	Noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21937	81	5			IPBES, 2019	Noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
20215	81	13		41	Consider combining this information with the section on deforestation further up.	Suggestion noted	Henry Neufeldt	UNEP DTU Partnership	Denmark
21939	81	16			IPBES, 2019	Noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21941	81	23			IPBES, 2019	Noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
3593	81	31			idem	Noted	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
35153	81	31			space 7% (919, 000 km2) Instead of 7%(919, 000 km2)	Noted	Happiness Nnko	The University of Dodoma	United Republic of Tanzania
21943	81	32			IPBES, 2019	Noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
3595	81	34			idem	Noted	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
21945	81	35			IPBES, 2019	Noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
3597	81	36			idem	Noted	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
21947	81	38			IPBES, 2019	Noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
3599	81	39			idem	Noted	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
21949	81	40		41	IPBES, 2019	Noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21957	81	44			namely:	Noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21951	81	47			IPBES, 2019	Noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21959	81	48			three fold (sapace)	Noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21953	81	50			IPBES, 2019	Noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
3601	81	52			idem	Noted	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
21955	81	54			IPBES, 2019	Noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
35155	82	8	82	10	space: GtC instead of Gt C	Noted	Happiness Nnko	The University of Dodoma	United Republic of Tanzania
6073	82	10	82	10	Replace "melting of permafrost" with "thawing of permafrost" (only the ice in the ground melts not the soil and rock that surrounds it)	Accepted	Sharon Smith	Geological Survey of Canada, Natural Resources Canada	Canada
22213	82	14	82	27	To be more specific, is it possible to include loss of mangrove forest as an insperable loss of coastal habitat	Suggestion noted and will be considered in the SOD	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
25107	82	37	82	44	Reference is made only on SDG 3, yet interlinkages with other SDGs could be considered (e.g. SDGs 1, 2 and 13)	Accept	Eleni Kaditi	Organization of the Petroleum Exporting Countries (OPEC)	Austria
19723	82	43	82	44	The relationship can be positive or negative, as in the case of certain aspects of biodiversity and infectious diseases.	Suggestion noted	Mochamad Indrawan	Research Center for Climate Change - Universitas Indonesia (RCCC-UI)	Indonesia
19725	82	43	82	44	the statement above may be tied with the following reference - which highlights te connections between wildlife trade and emerging diseases	Suggestion noted	Mochamad Indrawan	Research Center for Climate Change - Universitas Indonesia (RCCC-UI)	Indonesia

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
19727	82	44	82	44	Rostal MK, Olival KJ, Loh EH, Karesh WB (&) EcoHealth Alliance. 2012. Wildlife: The Need to Better Understand the Linkages. Current Topics in Microbiology and Immunology 365: 101–125 DOI: 10.1007/82_2012_271	Suggestion noted	Mochamad Indrawan	Research Center for Climate Change - Universitas Indonesia (RCCC-UI)	Indonesia
21973	82	1		27	better if compare with others research not only from IPBES	Accept	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
20217	82	1		53	Use IPCC uncertainty language	Accept	Henry Neufeldt	UNEP DTU Partnership	Denmark
21961	82	1			IPBES, 2018e (using comma before year)	Noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
3603	82	2			idem	Noted	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
3605	82	3			idem	Noted	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
21963	82	4			(using comma before year)	Noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
3607	82	5			idem	Noted	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
21965	82	6			(using comma before year)	Noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21969	82	10		11	et al.	Noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21967	82	10			(using comma before year)	Noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21971	82	11		12	total area changes?	Noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
22413	82	29		29	"... Sustainable Developement Goals (SDG)". Then in de text later on could be just SDG where many times is mentioned.	Accept	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
21975	82	29		44	better if compare with others research not only from IPBES	Accept	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21977	82	29		44	see also SDGs goals 2015-2030 (XV: Life on Land)	Accept	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21987	82	29			Sustainable Development Goals (SDGs)	Noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21979	82	41			(using comma before year) Example IPBES, 2018e	Noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21981	82	48			(using comma before year) Example IPBES, 2018e	Noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21983	82	49			(using comma before year) Example IPBES, 2018e	Accept	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
48113	82	50			It is important to highlight here the objective of sustainable development that speaks of gender equality, since women play a very important role in agriculture and new ruralities.	Suggestion noted	Verónica Gutiérrez Villalpando	Consejo Nacional de Ciencia y Tecnología comisionada en el Colegio de Postgraduados	Mexico
21985	82	53			(using comma before year) Example IPBES, 2018e	Accept	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
22215	83	2	83	2	Miss of space after the word "80%"	Noted	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
40297	83	26	83	27	I think there is need to underscore the influence of extreme weather events on mitigation and adaptation responses. For example, in the tropics and especiall with afforestation (i.e. young trees or tree seedlings can be affected by both droughts and floods)	Thanks for the suggestion.Point noted	Barnabas Msongaleli	University of Dodoma	United Republic of Tanzania

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
25793	83	30	83	33	Examples of sentences that can be removed: these concepts are covered earlier in the chapter.	Accept	Helen Hughes	University of Edinburgh	United Kingdom (of Great Britain and Northern Ireland)
12023	83	30	83	43	Please include a definition of "Nature-based solutions" in the glossary	Noted. Will include the definition in the glossary	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
29099	83	32	83	32	Might be useful to define Nature-based solutions as used in the chapter. Currently not in the glossary. Does this sentence refer to ecosystem restoration?	Accept. The definition will be included in the glossary. Will check whether the reference is to ecosystem restoration	Minal Pathak	Ahmedabad University	India
44659	83	34	83	34	What exactly is the "the central 2°C scenario"?	It refers to the Paris Climate Agreement goal for limiting temperature rise to 2 C	Oliver Geden	German Institute for International and Security Affairs	Germany
35359	83	34	83		I suggest to add a few sentences to highlight a mitigation/adaptation synergy potential in agricultural sector as follows (before the deiscription in LULUCF sector). "Increasing soil carbon sink has a high potential for mitigation/adaptation synergy (e.g., 4 per mil initiative). Due to its multi-functionality (fertility, water holding, aggregation, biodiversity), soil carbon enhancement in arid and semi-arid regions around the world can increase drought tolerance of the crops. Based on global crop and soil datasets, relatively small addtion of soil organic carbon (4.87 Gt) could lead to ca 16% increase in farmer's economic output in drought years (Iizumi and Wagai, 2019)." Ref: Iizumi, T., Wagai, R. Leveraging drought risk reduction for sustainable food, soil and climate via soil organic carbon sequestration. Sci Rep 9, 19744 (2019). https://doi.org/10.1038/s41598-019-55835-y	Will consider the suggestion keeping in mind the space constraints for the SOD.	Rota Wagai	National Agriculture and Food Research Organization, Institute for Agro-Environmental Sciences, Division of Climate Change	Japan
1471	83	39	83	39	This paragraph lacks the policy related discussions. Consider to add " Obersteiner et al. (2016) suggested that the policies assoicated with resource-use and management can yield more effective impacts on the achievement of land resource related SDGs than the socioeconomic futures (e.g. population and economic growth pathways)." after "(Keramidas et al., 2018)" in line 39. (Obersteiner, M., Walsh, B., Frank, S., Havlík, P., Cantele, M., Liu, J., Palazzo, A., Herrero, M., Lu, Y., Mosnier, A., 2016. Assessing the land resource–food price nexus of the Sustainable Development Goals. Science advances 2, e1501499.)	Suggestion noted and will consider incorporating the point keeping in mind the space limitation for the SOD	JUNGUO LIU	Southern University of Science and Technology	China
44661	83	41	83	43	This is the original claim by Griscom et al. 2017, isn't it? It's referenced in ch7, p.50, and the same reference should be used here	Noted	Oliver Geden	German Institute for International and Security Affairs	Germany
6273	83	45	83	48	The sentence should be shifted and accommodated in the next paragraph (Page 7-84 line 13) which is explaining the negative side. 'However, the large-scale deployment of intensive Bioenergy plantations, including monocultures, replacing natural forests and subsistence farmlands, will likely have negative impacts on biodiversity and can threaten food and water security as well as local livelihoods, including by intensifying social conflicts (IPBES 2019)'. The current paragraph described positively.	Accept	Brown Gwambene	Marian University College	United Republic of Tanzania
12155	83	45	83	48	On page 4 line 18-22 it is stated that "Across the different scenarios median change of global fores area through out the 21st century reaches up to a required 7.2 Mkm2 increases between 2010 and 2100, and agricultural land used for second generation bioenergy crop production may require up to 6.6 Mkm2 in 2100, both enhancing competition for land and affecting potentially sustainable development." On page 83 line 45-48 it is written that "However, the large-scale deployment of intensive bioenergy plantations, including monocultures, replacing natural forests and subsistence farmlands, will likely have negative impacts on biodiversity and can threaten food and water security as well as local livelihoods, including by intensifying social conflicts (IPBES 2019)." It would be helpful if the text in these paragraphs could also include more specific information on how these interests better could be balanced.	We don't see any contradiction between the two statements. While the first notes that bioenergy production may exert greater pressure on land resources and affect sustainable development,the latter points out its negative effects especially on biodiversity, food and water security, and livelihoods.	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
17329	83	45	83	48	Please check and provide at least one example, where intensive bio-energy plantations are modelled to replace natural forests.	Suggestion noted and will check for an example	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany
32143	83	25	84	18	This is a nice reading on "Land-based Mitigation and Adaptation", However, this synergy needs to consider the governance characteristics of the countries and/or landscapes. Please have a look on the following references (in which synergy between Adaptation and Mitigation are explore in the context of biodiversity conservation) and explore how to consider governance issues that can favor/slow the synergy between Adaptation and Mitigation. Somorin OA, IJ Visseren-Hamakers, B Arts, AM Tiani, DJ Sonwa (2016) Integration through interaction? Synergy between adaptation and mitigation (REDD+) in Cameroon. Environment and Planning C: Government and Policy 34 (3), 415-432 Chia EL, OA Somorin, DJ Sonwa, YM Bele, MA Tiani (2015) Forest–climate nexus: linking adaptation and mitigation in Cameroon's climate policy process. Climate and Development 7 (1), 85-96 Chia, E.L., Somorin, O.A., Sonwa, D.J., & Tiani, A.M. (2013). Local vulnerability, forest communities and forest-carbon conservation: Case of southern Cameroon. International Journal of Biodiversity and Conservation, 5, 498–507 Somorin, O.A., Brown, H.C.P., Visseren-Hamakers, I.J., Sonwa, D.J., Arts, B., & Nkem, J.N. (2012). The Congo Basin forests in a changing climate: Policy discourses on adaptation and mitigation (REDD+). Global Environmental Change, 22, 288–298. doi: 10.1016/j.gloenvcha.2011.08.001	Thanks for the references.Will consider the suggestion keeping in mind the space constraints for the SOD. Some of these issues may be considered in other sections of this chapter or other chapters that discuss policy and governance issues.	Denis Jean Sonwa	CIFOR (Center for International Forestry Reseacrh)	Cameroon

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
38735	83	25	84	18	There is a growing argument that synergistic approaches to adaptation and mitigation could bring substantial benefits at multiple scales in the land sector, and that the treatment of adaptation and mitigation as different policy options increases the costs of climate change Kane S, Gary Y. Societal adaptation to climate variability and change: an introduction 2000:1–2. Duguma LA, Minang PA. Climate Change Mitigation and Adaptation in the Land Use Sector : From Complementarity to Synergy 2014:420–32. https://doi.org/10.1007/s00267-014-0331-x.	Suggestion noted. Thanks for the references	Adriana Mordente	United Nations Convention to Combat Desertification	Germany
20219	83	45	84	8	This is squarely WG2 territory. Please make the link explicit	Suggestion noted	Henry Neufeldt	UNEP DTU Partnership	Denmark
39833	83	53	84	1	GCA(2019) is cited to state "climate change may depress global agricultural yields by up to 30 per cent by 2050", but CGA (2019) is not an original citation for this estimate; it was from IPCC AR5 (Food Security Chapter, Porter et al. 2014). However, I could not confirm that Porter et al. (2014) indicated the global yield depression of as large as 30% due to climate change by 2050, as cited in GCA (2019). Please check this number and refer to other chapters and the WG2 report (SOD in progress).	Suggestion noted. Will check the same.	Hasegawa Toshihiro	National Agricultural and Food Research Organization	Japan
39835	83	25	87	8	The Link between mitigation and adaptation is an important topic, but currently, based on only a few reports. The section could be strengthened by incorporating some examples for synergies and trade-offs.	Accept. Will discuss synergies and trade-offs in the SOD	Hasegawa Toshihiro	National Agricultural and Food Research Organization	Japan
21989	83	1		48	(using comma before year) Example IPBES, 2018e	Accept	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
3609	83	2			space before (35 out of 44)	Accept	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
21991	83	3			Sustainable Development Goals (SDGs)	Accept	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21993	83	13			SDGs	Accept	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
21995	83	20			SDGs	Accept	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
3611	83	25		41	This paragraph is redondant with the elements displayed in former paragraphs as the 7.5.1.	Noted	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
6885	83	41			" Nature-based solutions" maybe analyse it a bit more through the use of examles?	Will consider the suggestion	Valasia Iakovoglou	International Hellenic University	Greece
3613	83	42			space needed between 37% and of	Accept	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
43289	83	43			mention here the adaptation value of natural climate solutions: soil C sequestration by ag -- more water holding capacity; drought resistance and crop resilience; forest minimizes extreme heat locally, and promotes rainfall, possibly cloud cover--supporting rain-fed ag and cooling locally/globally	Suggestion noted	Deborah Lawrence	University of Virginia	United States of America
21997	83	44			GHG	Noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
16657	84	10	84	10	I don't think the land degredation case is well made in the chapter. This is mainly on forest	Noted. Will consider this in the SOD	Bruce McCarl	Texas A & M University	United States of America
1499	84	10	84	21	Only avoiding, reducing and reversing land degradation is not sufficient. We need to restore the degraded ecosystems. Ecological restoration is an effective approach to mitigate climate change, but a good design of restoration project should follow international standards and principles (Guan et al., 2019; Gan et al., 2019). (1) Gann G.D. et al., 2019. International principles and standards for the practice of ecological restoration. Second edition. Restoration Ecology 27 (S1): S1–S46. (2) Guan Y., Kang R., Liu J., 2019. Evolution of the field of ecological restoration over the last three decades: a bibliometric analysis. Restoration Ecology 27 (3): 647-660.	Thanks for the suggestion and references	JUNGUO LIU	Southern University of Science and Technology	China
6075	84	15	84	15	Does this include frozen/northern peatlands?	The cited reference does not elaborate on this aspect.	Sharon Smith	Geological Survey of Canada, Natural Resources Canada	Canada
16607	84	10	#REF!	####	I don't think the land degredation case is well made in the chapter. This is mainly on forest	Thanks for the comments. Will review this in the SOD	Bruce McCarl	Texas A & M University	United States of America
21999	84	5		18	(using comma before year) Example IPBES, 2018e	Noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
14873	84	7			Add ref for yield loss in India (1. Simulating impacts, potential adaptation and vulnerability of maize to climate change in India K Byjesh, SN Kumar, PK Aggarwal - Mitigation and adaptation strategies for global change, 2010; 2. Impact of climate change on crop productivity in Western Ghats, coastal and northeastern regions of India, SN Kumar, PK Aggarwal, S Rani, S Jain, R Saxena… - Current Science, 2011)	Thanks for the suggested references. Will consider this keeping in mind the space constraints for the SOD	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
26947	85	1	85	9	It's a nice figure, but if it has already been published in IPBES, what is the point of repeating it here? This report should be an assessment of new science, not a primer in climate change science.	Suggestion noted. This is an assessment based on the scientific literature as well additional new analysis. There is nothing wrong in republishing the figures here. However we are reducing some of the figures keeping in mind the space constraints for the SOD	Louis Verchot	International Center for Tropical Agriculture	Colombia
19815	85	3	85	10	Since there are two indicators for categories 11-13 each, it is not impossible that there is an overall decline there, too	Yes it is quite possible that there may be a decline in the overall trend.	Michael Englisch	Austrian Research Centre for Forests	Austria
3615	85	1			In figure 7.29, the time periods (1970 to present) are not easy to understand	This figure is taken from an IPBES report of 2019. So it considers the five decades after 1970.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
22001	85	2		10	Figure 7.29 title is too long make it simple but easy to understand	This is the title given to the figure in the IPBES report	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
11321	86	2	86	3	Is it possible to include small islands as a separate catergory in this figure???	This figure is taken from an IPBES report of 2019 and small islands were not included as a separate category in the figure . Will try and see whether we can get some information from some other studies pertaining to small islands	Mahmood Riyaz	Maldivian Coral Reef Society	Maldives
19817	86	6	86	14	What is the unit of the y-Axis ? Or: Are there different units ?	Point noted and will be verified.	Michael Englisch	Austrian Research Centre for Forests	Austria
20679	86	6	86	14	Figure 7.30 raises questions about the use of the scenario name "Global Sustinability". The fact the species richness declines in every region in this scenario (albeit less than in the other scenarios) exposes the shallowness (even cynicism) of the name. It seems like this naming opens up the door for unecessary - and ultimately distracting and unproductive - criticism concerning the values and definitions of the IPCC.	Point noted and will review this while preparing the SOD	Vassilis Daioglou	Copernicus Institute of Sustainable Development	Netherlands
22003	86	6		16	Figure 7.30title is too long make it simple but easy to understand	This is the title given to the figure in the IPBES report of 2019. Will review this in the SOD.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
3617	86	14			In figure 7.30, the last line of the title, erase "is"	Noted	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
43971	86				Figure is insufficiently explained, e.g. what does competition mean in this context? Differentiation according to climate scenarios and degrees of global warming unclear. Overlap with WGII mission suggests coordination is needed.	This figure is taken from the IPBES Global Assessment report of 2019. Will check the points raised by you while preparing the SOD.	Hans Poertner and Elvira Poloczanska	Alfred-Wegener-Institut	Germany
28801	87	15	87	15	What does mean?	accept, was a placeholder	Alireza Yazdani	Shiraz University	Iran
12285	87	21	87	40	The major issues in the use of global models should be taken under consideration. Appropriate verification should be common for inventory methodologies include models, for upscaling to regional and then global levels. These are mostly lacking/inappropriate including availability and supply of activity and measured data, as well as lack of common, appropriate/consistent methods/approaches to be adopted globally. It is to provide consistent outputs to identify gaps and measures for mitigations and formulation of effective policies for implementation	Noted. The comment is a bit generic but we'll try to reflect it in the SOD	Mohammad Ibrahim Khalil	University College Dublin	Ireland
1431	87	42	87	42	I propose that IPCC should recommend countries to move to tier 2 in order tohave more precise measurements that will allow for more educated recommendations	Reject. Recommending the tier level to be used is outside the scope of the report.	Juan Jose Grigera Naón	Sociedad Rural Argentina (member of ICC Argentine branch)	Argentina
12287	87	50	87	52	Even it is applicable in developed countries due to insufficient and short-term funding to come up with effective models. Thus it is important to make available long-term coupled activity and input data (measured) for simulation and validation.	Noted. The comment is a bit generic but we'll try to reflect it in the SOD	Mohammad Ibrahim Khalil	University College Dublin	Ireland

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
17335	87	18	90	9	Please remember that there are currently different GHG Inventories prepared and submitted to the UNFCCC. The term „LULUCF“ is in the framework of the Kyoto-Protocol, whereas „AFOLU“ is from the general reporting framework under the Convention (2006 Guidelines). Both do not cover the same emissions and removals (especially as Agriculture is a separate sector under KP). Please make sure you refer to the correct sector here and do not compare „apples and oranges“ (especially make sure agricultural emissions ar eincluded in all emission estimates from managed lands or are excluded in all estimates termed „LULUCF“). This also holds for exerpts from Grassi et al., make sure you (and them) did not misinterpret findings because of mixed definitions. Please also keep in mind that in some cases countries have the liberty not to report removals in case they can assure that a pool is not a source.	Noted. We believe that current text "The anthropogenic AFOLU CO2 emissions are included in the “Land Use Change” flux by global models and in the Land Use, Land-Use Change and Forestry (“LULUCF”) sector by the country GHG inventories reported to the UNFCCC" is clear and precise enough (some minor CO2 emissions can potentially be reported under the Agriculture sector, but it's negligible in this context). This text refers to reporting (not accounting) under the UNFCCC (not Kyoto). The distinction between Agriculture and LULUCF will be made more clear in the SOD	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany
26949	87	18	90	9	A lot of this material is a repeat of the SRCCL, but this report unpacks it a bit more. Authors should consider the value of repeating this and if this stays, this material should be presented closer to the material presented in section 7.3. Leaving this to the end reduces its value. The section needs to be clear on what the new message is that was not in the message of the SRCCL.	Accepted. This section in now merged with 7.3	Louis Verchot	International Center for Tropical Agriculture	Colombia
9673	87	21	90	9	I have a broader issue with this section. It is about the upcoming stocktake as indicated the in first paragraph, but the basic assumption underlying this section is that the AFOLU part of the global stocktake is based on comparing global models and GHG inventories, which I think is far too limiting given that it is supposed to be “in light of best available science”. No doubt there is an important role of global models and GHG inventories in this and trying to understand and resolve differences is critical. But the authors give the impression that if inconsistencies between models and inventories are resolved (using simple approaches) we can easily compare and add things up for the stocktake. This assumption is flawed since the comparison of numbers might seem to work at global scale but not on regional levels, in particular for different parts of the (sub-)tropics. I am a bit reminded of a study a few years ago where different scientists trying to develop consensus on carbon emissions from tropical deforestation and the pan-tropical numbers matched but the regional differences were very large and at the end gave the impression how poor the data and underlying assumptions were (https://pdfs.semanticscholar.org/3535/9f1f712fdfa50e6a67fed5fa3e52bc8991ee.pdf). Because the global aggregate numbers reasonably compare does not mean a real comparison makes sense if the underlying data/information regionally and/or for different pools/activities/processes/compartments etc. do not. So the proposed approach misses a proper much more “data-driven” dimension to build confidence and understanding and proof that this framework is the right one for the global stocktake. Important sources of data and information that are relevant are basically neglected. I can mostly assess that for the land Earth Observation (EO) side of things but perhaps there are others as well (i.e. atmospheric Earth Observations). In previous parts of this AFOLU chapter a lot of global and systematic and consistent information derived from Earth Observation data (i.e. on global land use change, deforestation/reforestation, fire, biomass) is used to underpin this report (i.e. section 7.2). It is true that EO-based approaches have not yet provided comprehensive “data points” on a full AFOLU flux that could be added to section 7.3.2. and Fig. 7.11, but that does not mean the data available should not be useful in a comparison of GHG-I and global models. I also note that none of the authors of this chapter is from the global Earth Observation community while this is a key source of information for this section. My suggestion for section 7.8 is to formulate this is in a much more open and accommodating way and not prescribe how the stocktake should be done for AFOLU. Other important and evolving data sources need to be discussed and mentioned (also to be consistent even within this chapter); including a proper assessment of potentials and limitations of these as much as for global models and GHG-I as well.	Accepted. Language to be changed in the SOD to reflect the comment, e.g. text on the GST is more open; a reference to the role of earth observation is made; a reference to the importance of regional comparison is made. We also note that the data-driven argument to increase confidence in data is particularly relevant for the transparency Framework, which is not specifically addressed in this section	Martin Herold	Wageningen University	Netherlands
3619	87	7			white bars	Comment not clear. What is the issue about the white bars ?	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l’environnement	France
22005	87	10			Source: SPM Figure 8 (IPBES 2019) put in the text?	Accept	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
3621	87	13			paragraph 7.7.4 is empty	Noted. It is planned to develop this subsection in the second order draft, in coordination with Ch. 12.	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l’environnement	France
10513	87	18			This section seems quite disjointed with the rest of the chapter - can this be integrated (perhaps as a box) with section 7.3, which after all discusses trends in GHG emissons and that will have to assess different databases anyway? It would seem much more organic there and have better context.	Accepted. This section in now merged with 7.3	Andy Reisinger	NZAGRC	New Zealand
3623	87	29			sextion xxx	Accepted. A more precise reference to the section to be added in the SOD	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l’environnement	France

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
29975	87	29			Please let us know what section mean 'XXX'.	Accepted. A more precise reference to the section to be added in the SOD	RAEHYUN KIM	Institute	Republic of Korea
3625	87	44			GtCO2… space… yr-1	Accepted	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
29747	87	47			Pongratz et al. 2018; Add this article to the reference	Accepted	RAEHYUN KIM	Institute	Republic of Korea
3627	87	49			other refs) refs are incomplete	Accepted	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
22009	87	53		54	What is the alternative tools to measure more accurate and quantify GHG inventories	Accepted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
3629	87	53			erase "in the"	Accepted	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
14875	87	53			delete (in the); repitition	Accepted	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
22007	87	53			double type "in the"	Accepted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
27375	88	31	88	32	In 10.1038/nclimate2004 and 10.1111/gcb.15004 we show that "direct human induced" is not entirely correct. Some direct effects, such as forest grazing, are just not included in models, but the effects would be direct. Thus, in particular related to the bk models, I would suggest to say "direct harvest-related impacts", because that is what bk models do. The "isolate" these effects, and only these effects. Thus, the budget "indirect human impacts" actually contains three fractions: a real "natural" effect, e.g. effects of changes in the solar constant (probably negligible), and the indirect effects (N-fertilzation, CO2 fertilization, other env. changes), but also the omitted direct land-use effects (forest grazing, grazing of savannas, litter raking, pollarding, etc.). Unfortunately, this message was not well conveyed in the SRCCL, but could be made here in order to reflect the current state of research.	Accepted. We retain the "Direct human induced effect" term because it some from IPCC (2010) but changes if the SOD text as: "....most "direct human induced effects" (i.e., land use change, harvest, regrowth, but excluding some management such as forest grazing, grazing of savannas, litter raking, pollarding, etc)"	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
3631	88	1			GtCO2… space… yr-1	Text removed	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
22011	88	10			IPBES, 2019 (using comma)	Apparently not in the indicated place	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
3633	88	14			I do not understand c) forest area etc. what are 000?	Accepted. Now added "thousands"	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
22013	88	15			[Placeholder-For SOD]???	Apparently not in the indicated place	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
17333	89	15	89	17	Please clarify; does „intense management" mean land-cover change, i.e. clearcut harvest? If the answer is „yes", these models are just not capable of capturing managed forests.	Accepted. "clear cut" now added. The limits of these models are spelled out	Joachim Rock	Thuenen-Institute of Forest Ecosystems	Germany
22217	89	28	89	44	Capital letter on "Table"	Accepted	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
1473	89	33	89	35	Acturally, there is also large uncertainty in estimation of CO2 emission based on different inventory methods or modelling, rather than only the uncertainty related to the difference of global modelling results and the country inventories. For example, Liu et al. (2015) found inventories of China's total fossil fuel carbon emissions in 2008 differ by 0.3 gigatonnes of carbon, or 15 percents. The primary sources of this uncertainty are associated with conflicting estimates of energy consumption and emission factors, the latter being uncertain because of very few actual measurements representative of the mix of Chinese fuels. The sentence could be consider to revised to "Even if the current discrepancies between global models and country GHG inventories can be harmonized (Rojeli et al. 2011) or corrected for, and neglecting the uncertainties induced by the model or inventory methods themself, this may increase the uncertainty of the future emission gap (Rojeli et al. 2016)." (Liu, Z., Guan, D., Wei, W., Davis, S. J., Ciais, P., Bai, J., Peng, S., Zhang, Q., Hubacek, K., Marland, G., Andres, R. J., CrawfordBrown, D., Lin, J., Zhao, H., Hong, C., Boden, T. A., Feng, K., Peters, G. P., Xi, F., Liu, J., Li, Y., Zhao, Y., Zeng, N., and He, K.: Reduced carbon emission estimates from fossil fuel combustion and cement production in China, Nature, 524, 335–338, 2015.)	Noted. The point raised is treated more extensively in other sections . In the SOD we added the suggested text but not the references because it refers to fossil fuel and cement production and this chapter is on AFOLU	JUNGUO LIU	Southern University of Science and Technology	China

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
22015	89	6			IPCC, 2010 (using comma)	Accepted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
22017	89	19			In summary, ?? Should be at the end …	Noted. It is indeed at the end of the subsection.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
29767	89	34			Rojeli et al. 2011; Add this article to the reference	Accepted	RAEHYUN KIM	Institute	Republic of Korea
29769	89	35			Rojeli et al. 2016; Add this article to the reference	Accepted	RAEHYUN KIM	Institute	Republic of Korea
20221	89	47			Mention the Emissions Gap Report (UNEP 2019)	Accepted	Henry Neufeldt	UNEP DTU Partnership	Denmark
22019	89	52			Table 7.13 title is to long	Accepted. The title shortened in the SOD	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
28803	90	12	90	23	Determining the gaps could be one of the most important parts in each report, amd so I excpet "Knowledge gaps" part is more extended than current. The current gaps section jus mention some cases and does not expxlain each cases. It`s very unclear.	accept, section will be improved	Alireza Yazdani	Shiraz University	Iran
46373	90	12	90	24	Understanding stakeholders' behaviour regarding the implementation of mitigtion and adaptation measures is a knowledge gap as well and should be consindered. Similarly, better understanding of the barriers to implement mitigation and adaptation practices is also required. Finally, the role of culture in the implementation of mitigation and adaptation is crucial.	accept, section will be improved	Diana Feliciano	University of Aberdeen	United Kingdom (of Great Britain and Northern Ireland)
9289	90	14	90	15	Suggestion for section on 'Understanding functioning of the biosphere' - lack of understanding of deep soil carbon and its interactions with both management of agri systems and overall role in carbon stock. See recent work on this by Tautges et al 2019 in Global Change Biology: https://doi.org/10.1111/gcb.14762	accept, section will be improved	Eamon Haughey	Trinity College Dublin	Ireland
36673	90	24	90	24	The list of knolegegaps ahould include maladaptations, future agricultural developments	accept, section will be improved	NARESH KUMAR SOORA	Indian Agricultural Research Institute	India
9675	90	26	90	26	Very nice to see the case studies. However, we have 2 cases on agriculture and 1 on forestry but those choices are neglicting the most important AFOLU mitigation potential impact part which is to reduce deforestation or enhance re/aforestation (in the (sub-tropics). While some successes in REDD+ countries are mention earlier in the section, wouldn't it be most relevant and useful to have one of those explained in more, looking at table 7.3 the case of Brazil would be the most suitable choice and can mention the fact that deforestation rates are starting to pick up again etc.	accept, cases will be reconsidered and merged more into the text	Martin Herold	Wageningen University	Netherlands
9925	90	26	90	26	This section is entitled "Case studies". You should specify "of what" both in the title and with an introductory paragraph to the section. Browsing through the case studies, I don't see any obvious coherence: some are very detailed mitigation actions (CSV), some are very broad mitigation concepts (eg. CSF), some are country-wide studies (India), ...	accept, cases will be reconsidered and merged more into the text	Valentin Bellassen	INRAE	France
27381	90	26	90	26	an introduciton is needed that gives the rationale for case studies (what should the case studies show, how and why have they been selected, what are the criteria, what are the cases to be made, what is their scope, how do they relate to the overall chapter, etc.). Currently, the selection appears arbitrary and the aim or messages conveyed remain anectodal without such a contextualization.	accept, cases will be reconsidered and merged more into the text	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
36681	90	26	90	26	Include the climare resilient villages studies from the NICRA project in India. As suggestedhave Box items for such examples covering more than one source for a region to provide the better and convencing information for policy makers to take a note	accept, cases will be reconsidered and merged more into the text	NARESH KUMAR SOORA	Indian Agricultural Research Institute	India
43067	90	26	90	26	The four cases are all structured in a slightly different manner. It might be useful to adopt a common structure to present the case studies. Further, context specific governance barriers and enablers for each mitigation option should be specifically highlighted.	accept, cases will be reconsidered and merged more into the text	Parth Bhatia	Centre for Policy Research, New Delhi	India
17525	90	26	90	28	I think these case studies are important, as the main text of the chapter is largely focused on potential mitigation. The case studies should offer a chance to explore the practicalities, trade-offs and co-benefits for these mitigation actions. However, in their current form there Is not enough depth to achieve this- Case 1. I think this case study could be more focused to allow for an in-depth analysis of the pros and cons of the approach. It may be better if this were a true case study focused on one representative example of CSV in action. Currently, it attempts to summarise many examples, but this losses depth.	accept, cases will be reconsidered and merged more into the text	Aidan Farrell	The University of the West Indies	Trinidad and Tobago
36675	90	32	90	32	The number of CSV are far more than 36….needs updating	accept, to be checked	NARESH KUMAR SOORA	Indian Agricultural Research Institute	India
6887	90	32	90	33	Howo many in each continents?	accept, to be checked	Valasia Iakovoglou	International Hellenic University	Greece

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
26951	90	28	93	19	The CSV experiment has been ongoing for more than a decade, yet the message that is being presented is that technology X gave result Y in place Z. Could the authors do some comparative analyses and draw policy relevant messages from experiences across agroecologies? Compost on coffee in Colombia is not globally relevant. It would be nice to see a stronger assessment approach presented in this case study and CCAFS has the data. The message could be about adoption of CSA technologies, or globally the potential of CSA techmologies to mitigation emissions and contribute to resilience.	accept, to be checked	Louis Verchot	International Center for Tropical Agriculture	Colombia
20223	90	28	93	20	The case study seems quite limited in scope and would need to assess literature from other CSVs as well. I also find it too long and not succinct enough.	accept, to be checked	Henry Neufeldt	UNEP DTU Partnership	Denmark
11323	90	26	101	14	Is it possible to include example from a small island as a case study??? Overall this section does not address small islands which is a category in the report.	accept, to be checked	Mahmood Riyaz	Maldivian Coral Reef Society	Maldives
38743	90		101		Case Studies with regards to Fertilizer Use that could be included in the document starting page 90. In 2015, China's Ministry of Agriculture introduced actions that seek to achieve zero growth in the use of chemical fertilizer and pesticides by 2020, through its program "Zero Growth of Chemical Fertilizer and Pesticide Use ". These measures would help prevent soil pollution, increase cost efficiency, energy conservation, achieve dual GHG emission reductions, protect food supply and ecosystems while achieving sustainable development of agriculture. Zero Growth of Chemical Fertilizer and Pesticide Use: China's Objectives, Progress and Challenges 10.5814/j.issn.1674-764x.2018.01.006 - Journal of Resources and Ecology Other countries with similar policies include Bosnia Hezergovina which has developed an agricultural law that prescribes a set of measures for land protection involving excessive use of fertilizers and pesticides. The law also addresses pollution, erosion and conversion. They plan to conduct permanent trainings and education for agricultural producers about use of pesticides and mineral fertilizers, and possibilities of implementing SLM with satisfactory production and economic viability.https://knowledge.unccd.int/sites/default/files/ldn_targets/2019-01/Bosnia%20and%20Herzegovina%20LDN%20TSP%20Country%20Report%20and%20Commitments.pdf	accept, cases will be reconsidered and merged more into the text	Adriana Mordente	United Nations Convention to Combat Desertification	Germany
46375	90		101		Case study section: There are no conclusions or general lessons learnt or suggested policies to incentivize implementation in other areas. This makes the section redundant.	accept, cases will be reconsidered and merged more into the text	Diana Feliciano	University of Aberdeen	United Kingdom (of Great Britain and Northern Ireland)
22021	90	1		4	pls make table more informative	accept, editorial	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
3635	90	12			the paragraph 7.9 Knowledge gap is empty	accept, this sections need to be fully developed in SOD	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
39801	90	12			you could include inorganic C as a knowledge gap	accept, this sections need to be fully developed in SOD	David Manning	Newcastle University	United Kingdom (of Great Britain and Northern Ireland)
46903	90	12			Social awareness and acceptance in different cultural settings as well as trade-offs to ecosystem services and SDGs are further major knowledge gaps. Particularly the latter are highly location specific.	accept, this sections need to be fully developed in SOD	Martin Schönhart	University of Natural Resources and Life Sciences, Vienna	Austria
10515	90	26			The case studies all seem to have a strong biophysical and hypothetical bias, i.e. looking at options of what could be changed, not what was actually changed, and how changed was or could be achieved. I'm therefore suggesting to include at least one case study on climate policy implementation (perhaps one on forestry, one on agriculture). One example for agriculture could be a summary of the policy development, but also barriers to implementation, of GHG policy for agriculture in New Zealand, especially now that the zero carbon act has been passed and the interim climate change committee delivered its recommendations for a price-based policy for agriculture that forms the basis of an implementation working group comprised of industry and government.	accept, cases will be reconsidered and merged more into the text	Andy Reisinger	NZAGRC	New Zealand
22717	90	26			Seems odd to end with Case Studies. Move them earlier and end on knowledge gaps or ideally a summary?	accept, cases will be reconsidered and merged more into the text	Melissa Lucash	Portland State University	United States of America
22023	90	35			Written GHG, write full text then following abbreviation : Greehouse Gas (GHG)	accept, editorial	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
12291	91	37	91	45	What about acidification and eutrophication potential?	accept, editorial	Mohammad Ibrahim Khalil	University College Dublin	Ireland
3637	91	13			to start	accept, editorial	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
14877	91	13			in order to start	accept, editorial	Niveta Jain	ICAR-Indian Agricultural Research Institute	India

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
22415	91	16		16	CSA, What is this? it is not mentioned. Is this Climate-Smart Agriculture? Indicate the first time, I believe this is just here.	accept, editorial	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
3639	91	23			in addition	accept, editorial	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
22025	91	23			written : adittion, it should be should be addition	accept, editorial	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
14879	91	24			Farmer to farmer	accept, editorial	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
3641	91	43			compost (which only accounts for 11% to 22% of total emissions) was therefore…?	accept, editorial	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
29893	91	43			van Rikxoort et al., 2014; Add this article to the reference	accept, editorial	RAEHYUN KIM	Institute	Republic of Korea
44169	92	0	92	0	Make the figures larger and clearer.	accept, editorial	Tshepiso Mafole	University of Cape Town	South Africa
39837	92	32	92	38	Nice to see an example, but it would be great if we can get a sense of the effects on mitigation. Please indicate the reference for this. Also, please specify climate stresses/biofortified in the text.	accept, editorial	Hasegawa Toshihiro	National Agricultural and Food Research Organization	Japan
36677	92	37	92	37	USD$ 24.oo shuld be US$ 24	accept, editorial	NARESH KUMAR SOORA	Indian Agricultural Research Institute	India
22219	92		92	28	"described"	accept, editorial	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
39839	92	40	93	19	It isn't clear what climate-smart home gardens are here and how it can contribute to mitigation. Please clarify with evidence.	accept, cases will be reconsidered and merged more into the text	Hasegawa Toshihiro	National Agricultural and Food Research Organization	Japan
14881	92	28			described	accept, editorial	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
14883	92	30			potential mitigation co-benefits with adaptation	accept, editorial	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
22417	92	33		34	I dont understand the use of "can" in the sentence. Would it be instead of can "in order to plan" or just "to plan"?	accept, editorial	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
3643	92	35			The production of beans also encouraged consumption in villages where they were not used to eating them	accept, cases will be reconsidered and merged more into the text	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
3645	92	37			$24 instead of $24.oo	accept, editorial	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
29981	93	1	93	9	Construction of farm ponds and developing integrated farming system centred around the new water source created is a viavle option for food security and climate smart AFLOU system in South Asia and South East Asia. Efficient irrigation mechanism consisting of increasing area coverage under micro-irrigation by converting area from flooding irrigation is to be targetted for promoting crop diversification from rice and sugar cane to less water requiring crops without comprromising the profit/net beniit earned by the farmers.	accept, editorial	sudhanwa patra	Utkal University	India
19729	93	18	93	19	Legumes allow nitrogen fixation in the soil, improving its quality and reducing nitrogen fertilizers used, which generate GHG emissions	accept, we will consider this	Mochamad Indrawan	Research Center for Climate Change - Universitas Indonesia (RCCC-UI)	Indonesia
19731	93	18	93	19	the sentence is repetition from previous para	accept, editorial	Mochamad Indrawan	Research Center for Climate Change - Universitas Indonesia (RCCC-UI)	Indonesia

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
22287	93	20	93	22	What urban agriculture? Some counrties (Canada and Singapore) have successfully implemented this agriculture which might contribute significantly to carbon sequestration.	accept, cases will be reconsidered and merged more into the text	Noureddine Benkeblia	The University of the West Indies	Jamaica
42681	93	25	93	38	Using recent space based observations of Orbiting Carbon Observatory-2, Chhabra and Gohel (2019) provided the estimates of dynamics of atmospheric CO2 over different landcover types in India. It may be useful to adopt technical mitigation potentials based on CO2 dynamics over agriculture, forest and other LC types in India.	Suggestion noted. The reviewer has not provided the full reference of the suggested study.	ABHA CHHABRA	Space Applications Centre, Indian Space Research Organisation	India
22221	93	26	93	26	Missing space after the word "%"	Noted	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
22223	93	41	93	41	Missing a period after "et al"	Noted	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
12293	93	47	93	53	There is limitations in using the CFT for this and similar purposes and that should be clearly stated here.	Point noted and will address this in the SOD	Mohammad Ibrahim Khalil	University College Dublin	Ireland
22225	93	48	93	48	Missing a period after "et al"	Noted	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
22227	93	51	93	51	Missing a period after "et al"	Noted	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
20225	93	23	96	23	This case study is broader, but it could also be shortened significantly. There should be no lengthy description of the methods as all that can be found in the original literature.	Accept.Will shorten the case study for the SOD.	Henry Neufeldt	UNEP DTU Partnership	Denmark
26953	93	23	96	23	This is a nice case study that presents policy relevant messages, but the english language expressin needs editing.	Accept.The final report will be copy edited before publication	Louis Verchot	International Center for Tropical Agriculture	Colombia
36679	93	23	96	23	This case study is too large and contnets are based on just one study.....I suggest instead of one paper based case studies include Box items with a syntheis of information on that particular topic/ region which should contain information from several studies to provide substantiated and valued information. .....avoid just one study reports. The farmers adaptation based mitigation values are worked out for some of the technologies based on sudies conducted in 12 villages in India under WB-GEF project....detalied report is available online at https://www.iari.res.in/files/ClimaticRisks.pdf	Accept. Will shorten the case study.The suggestion to include a box with several case studies will be considered keeping in mind the space limitations for the chapter. The policy chapter will present a box with illustrative case studies drawn for the AFOLU chapter and other chapters. Thanks for the suggested reference.	NARESH KUMAR SOORA	Indian Agricultural Research Institute	India
22027	93	5			What are the cost to opptimize (%) water resources compare to total cost of production	difficult to locate, in general the whole chapter will be improved significantly	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
22029	93	6			what are the significants losses related climate	difficult to locate, in general the whole chapter will be improved significantly	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
14885	93	12			This practice allows increased suitability of crops because by crop rotation	difficult to locate, in general the whole chapter will be improved significantly	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
22031	93	12			How is the productivity with crop rotation	difficult to locate, in general the whole chapter will be improved significantly	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
22033	93	15		16	provide productivity with single crop compare with difference crop at the same plot and cycle	difficult to locate, in general the whole chapter will be improved significantly	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
22035	93	19			is there any other organis material to enrich Nitrogen instead of to use nitrogen fertilizer	difficult to locate, in general the whole chapter will be improved significantly	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
22037	93	26		27	showns other sector constribute GHG	Not clear	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
3647	93	26			space needed between 18% and of	Noted	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
22419	93	34		34	Co2eq instead of CO2e	Noted	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
22039	93	36			How is cost saving measures ?	Comment not clear	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
3649	93	47			format of the paragraph	Noted	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
22229	94	4	94	4	Missing a period after "et al"	Noted	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
22231	94	5	94	5	Missing a period after "et al"	Noted	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
22233	94	32	94	32	Missing a period after "et al"	Noted	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
39841	94	40	94	41	Are there no trade-offs between land-based mitigation measures and production?	Point noted. Will examine this while drafting the SOD	Hasegawa Toshihiro	National Agricultural and Food Research Organization	Japan
22235	94	44	94	44	Missing a period after "et al"	Noted	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
22421	94		101		co2eq instead of CO2e, text and figures 7.34 and 7.35 Y-axis	Noted	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
22041	94	2			IPCC ?	Not clear	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
22043	94	4			IPCC Methodology	The sentence clearly states that this is based on IPCC methodology as mentioned in the cited study.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
14887	94	5			Although the paper (Sapkota et al. 2019) mentions about the CO2 emission from urea application and limimg but there is no mention in the result section and how it was helpful in estimating mitigation cost. More over how the liming rates were taken is not clear (there is not data available for use of lime in agriculture sector in India)	Point noted and will consider this while preparing the SOD	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
22045	94	6			IPCC Methodology	Not clear	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
3651	94	18			a dot is missing	Noted	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
22047	94	33			Business as Usual (BAU)	Noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
39843	95	1	95	3	This is an important message. Can you provide the reference and any confidence levels I available?	Noted and will check for a reference	Hasegawa Toshihiro	National Agricultural and Food Research Organization	Japan
22237	95	19	95	19	Missing a period after "et al"	Noted	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
12087	95	20	96	8	Case 2 is good. However, figure 7.32 and 7.33 are hard to read and understand.	Point noted. The case study will be shortened as suggested by reviewers and the figures may/may not be included in the SOD which is also due to the overall space constraints for the chapter.	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
3659	95	7			in table 7.14, what is NUE?	Thanks. Will check the study to clarify this. But see also my response to your previous comment on including or excluding the figures from the case study due to the overall space constraints for the chapter	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
3653	95	13			space between e and ha-1	Noted	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
3655	95	14			idem	Not clear	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
3657	95	15			idem	Not clear	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
3661	95	21			in figure 7.33, please to add y-1 in ordinate	Not clear	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
6889	95	21			Figure 7.33 I think "buffalo" and "wheat" seem to have the same color. Please considering changing it in a way that is easy to distinquish each part.	Suggestion noted. This figure is taken from the cited case study. The case study is to be shortened as suggested by reviewers and also in order to conform to the overall space limitations for the chapter. The figure may be included or omitted in the SOD. And if it is included the graphic designers will address the issue raised by you to make the figures clearer.	Valasia Iakovoglou	International Hellenic University	Greece
29029	96	1	96	23	the figures are too small, consider re-draw it	Noted	Marissa Malahayati	National Institute for Environmental Studies	Japan
12295	96	25	96	25	An example how achieving the goal would be highly useful.	Noted. This will be considered.	Mohammad Ibrahim Khalil	University College Dublin	Ireland
27377	96	25	97	37	The biophysical effects need to be integrated here, even if there is not much evidence. A key paper certainly is 10.1126/science.aad7270, but also 10.1038/s41586-018-0577-1	Noted. This will be considered and thank you for the suggested reference.	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
43065	96	25	97	37	Kindly specify the typical policy instruments (or package of instruments) used under this approach or provide a specific empirical example of the policy instruments deployed in practice.	Noted. Consideration will be given to outlining policy instruments.	Parth Bhatia	Centre for Policy Research, New Delhi	India
43973	96	25	97	37	Discussing species functional properties and thermal ranges as well as upper evolutionary limits will be needed for a full comprehension of the concept of climate smart forestry for various regions. Discussion of such aspects from an overarching view for various regions would be warranted.	Noted. Consideration will be given to discussion on species characteristics and regional implications.	Hans Poertner and Elvira Poloczanska	Alfred-Wegener-Institut	Germany
27379	96	26	97	29	The passage is redundant with the passage on pg. 43f. The entire passage is built upon one paper published in the mdpi paper Forests - ; this is hardly an assessment of the literature and of the state-of-knowledge. Furthermore, this reference is much of a back-of-the-envelop calculation that needs critical assessment. The 568 MtCo2/yr need to be detailled, as well as additional CSF potential of 441 MtCO2, and robustly referenced/contrasted with other literature, including a time-frame for these sink potentials (that is missing in the passage). The entire passage requires a revision towards uncertainty language (this is important, it is a highly contexted theme, and evidence is apparently limited). Furhermore, and in particular, the trade-offs between increased productivity and C-stocks and bioenergy provision need robust elaboration, taking the steady-state system effects of harvest on biomass and soil carbon stocks into account (e.g. 10.1038/nature25138, but also 10.1016/j.ecolmodel.2012.10.006, 10.1016/j.jenvman.2017.12.076, 10.1088/1748-9326/ab28bb, 10.1038/s41586-018-0577-1) as well as a broader perspective on eg. biodiversity (e.g. 10.1016/j.biocon.2016.08.005, 10.1126/sciadv.aat1869). If only one paper is existing, the entire case-study presented is not well legitimated (as the assessment needs to be "low confidence").	Noted. The authors thank the reviewer for pointing this out and providing relevant references. These will be taken into consideration.	Karlheinz Erb	Institute of Social Ecology, Univ. of Natural Resources and Life Sciences Vienna	Austria
3663	96	5			in figure 7.33, ordinate are not clear	Noted	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
22049	96	8		14	Figure 7.34 title is too long	Noted. The case study is to be shortened as suggested by the reviewers and the figures may be included or omitted in the SOD which is also to adhere to the overall space limitations for the chapter.	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
22051	96	13		14	Source: Sapkota et al.	Noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
22053	96	18		23	Sapkota et al. (2019)	Noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
22055	96	18		23	Figure 7.35 title is too long	Noted.See the response given to previous comments	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
22715	96	25			Case 3 is not very strong. There's no evidence that it's working or moving forward, as in the other examples you present. Can you provide a more concrete example from a specific country or just omit it? It's so general that it's not really a case study.	Noted, all cases will be reconsidered and merged into the text more	Melissa Lucash	Portland State University	United States of America
3665	96	31			which needs to be…	accept editorial	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
608	97	16	97	16	"Commissionner Timmerman's new climate law" will need clarifications for non-EU readers	Noted, all cases will be reconsidered and merged into the text more	Pierre Bernier	Natural Resources Canada	Canada
44663	97	18	97	20	Hm, there's no EU climate law yet (just a EU Commission proposal that started the legislative procedure im March 2020, with the outcome not known before 2021). It's not Timmermans' proposal (but that of the EU Commission). And the proposal is very light on substance, so I'm not sure about the 'emphasis' part. But looking at the Commission's in-depth analysis on the EU 2050 net zero GHG target it is clear that forestry will have to play a larger role but it is unclear where exactly that might manifest itself conceptually and legally. Conceptually maybe in the Commission's (not: the EU's) new forest strategy or in the inclusion of the LULUCF sink into the accounting towards the EU's economy-wide emissions reduction target. Legally probably in a revised LULUCF regulation (maybe with net negative targets for Member States instead of the current 'no debit' clause)	accept, very useful. to rewrite the case	Oliver Geden	German Institute for International and Security Affairs	Germany
16871	97	19	97	19	Do we need to mention Timmerman by name? It seems out of place in a scientific document.	accept editorial	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
16873	97	22	97	22	a.o.'? Not clear.	accept editorial	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
27879	97	23	97	25	Avoid the use of 'have to' without phrasing it conditionally. It sounds very policy prescriptive. Suggest rewording.	accept editorial	Jenkins Rhosanna	University of East Anglia	United Kingdom (of Great Britain and Northern Ireland)
12089	97	30	97	34	Case 3 is a Good example. However, this section complains about the lack of monitoring. To improve the point, is it better to rewritten to encourage proper reporting? Instead of complaining about the lack of monitoring and how monitoring is an essential part of getting carbon credits.	accept, very useful. to rewrite the case	Maria Malene Kvalevåg	Norwegian Environment Agency	Norway
19819	97	30	97	34	I agree; Howeveer this view should be supported by literature and some altenatives might be given (eg strengthening the LUCAS, ICP Forests or ENFIN Networks)	accept, very useful. to rewrite the case	Michael Englisch	Austrian Research Centre for Forests	Austria
2947	97	35	97	35	(climate smart agro-forestry is also one of the best practices in China) add it as well here in the text "Finalising: a joint effort between Commission, Member States, industry, research and large public 36 owners will be needed to tackle the challenges as outlined above. Only then Climate smart forestry 37 will make its way into a large roll out and into practice .	Noted, all cases will be reconsidered and merged into the text more	Adnan Arshad	China Agricultural University	China
38747	97		97		In the case study of European Forestry, it would be worth mentioning in the rationale, that carbon stocks in forests saturate after a number of years, and that therefore this allows to tap into the CSF and HWP potential. The facilities that Europe has with regards to Forest management is in stark contrast with regards to the rest of the world. These facilities needs to be mentioned to avoid being prescriptive with other regions of the world who often emulate European Forestry models and often sacrifice of their own local biodiversity and primary forests with species that allow them to collect higher productivities WHP. This is specially true for the Global South.	accept, very useful. to rewrite the case	Adriana Mordente	United Nations Convention to Combat Desertification	Germany
26955	97	39	101	14	This section needs language editing	Editorial, being improved in SOD	Louis Verchot	International Center for Tropical Agriculture	Colombia
22057	97	8		10	elaborate the action plan to achieve three main objective CSF	Editorial, being improved in SOD	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
3667	97	14			please to harmonize CO2/year	Editorial, being improved in SOD	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
3669	97	17			please to harmonize CO2/year	Editorial, being improved in SOD	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
3671	97	22			tell what is a.o.	Editorial, being improved in SOD	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
3673	97	44			while ou with instead of which	noted	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
3675	97	45			the unit of 18.3 is missing	Unite is in the below line Tg CH4/yr	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
3677	97	46			space after CH4	Editorial	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
22059	97	47		48	methane emission, 85% Provide data	Noted , being added in SOD	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
3679	97	48			space after 85%	Editorial	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
14889	98	5	95	36	Implementation in India: In India crop diversification from water intensive crop paddy to crops like pulses, oilseeds,maize,cotton and agroforestry has been implemented in Styates of Punjab, Haryana and UttarPradesh since 2013-14. From 2014-2016 302509 ha of paady area has been been diversified to other crops resulting in emission reduction of 0.21Million t CO2e (NFSM,Ministry of Agriculture; BUR2 Report India, MoEFCC, India)	Noted and thank for information	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
14891	98	5	95	36	System of rice insification and direct seeded rice are the water saving rice cultivation practices. In India 162274 ha of rice area is under DSR. An emission reduction of 0.17Million t CO2 eq has been achieved due to DSR practice.(NFSM,Ministry of Agriculture; BUR2 Report India, MoEFCC, India)	Noted	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
14893	98	5	95	36	Policy Implementation in India: Nitrogenous fertiliser is crucial for enhancing agricultural productivity. When applied to soil it is also lost to environment through several pathways besides crop uptake. In India, Government has made it mandatory to coat the urea with neem oil (Azadirachta indica). The neem coated urea has potential to reduce N2O emission by approximately 11-15% (Malla etal 2005(Mitigating nitrous oxide and methane emissions from soil in rice–wheat system of the Indo-Gangetic plain with nitrification and urease inhibitors (G Malla, A Bhatia, H Pathak, S Prasad, N Jain, J Singh - Chemosphere, 2005); Gupta et al 2016 (https://doi.org/10.1016/j.agee.2016.05.023); Fagodia etal. 2019 (Nitrous oxide emission and mitigation from maize–wheat rotation in the upper Indo-Gangetic Plains RK Fagodiya, H Pathak, A Bhatia, N Jain, DK Gupta… - Carbon Management, 2019), This initiative has led to the emission reduction of of 8.89Mt CO2 eq from 2014-2016.	Noted and thank for information.	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
12297	98	6	98	11	It is not right. Nitrification under aerobic and denitrification under anaerobic conditions to occur rather than anoxic, which helps mainly complete denitrifcation and CH4 production to occur.	Noted	Mohammad Ibrahim Khalil	University College Dublin	Ireland
27877	98	14	98	16	Avoid the use of 'should' without qualifying/phrasing it conditionally. This sounds a little policy prescriptive. Suggest rewording.	Noted	Jenkins Rhosanna	University of East Anglia	United Kingdom (of Great Britain and Northern Ireland)
25873	98	21	98	36	It may be important to mention that this alternative is only valid if rice is not planted on peatlands. In Panama, rice plantations have been found in forested peatlands areas. Drainage is not used for this purposes but greenhouse gas emissions are increased due to the land use change. Applying drainage cycles in these ecosystems would potentially lead to peat subsidence and an increase in CO2 emissions. (see Hoyos et al. 2016; 10.1007/s11104-016-2824-2)	Noted, this paragraph focused on water management system where drainage is a common practice.	Jorge Hoyos-Santillan	University of Magallanes	Chile
12299	98	24	98	25	It is wise to be specific, when and how they should apply.	Noted	Mohammad Ibrahim Khalil	University College Dublin	Ireland
2919	98	29	98	29	As regards impact on yield, results differ depending on studies. For example, Oo et al. 2018 strongly recommended AWD methods be adopted for efficient reduction of CO2-eq emission without reducing grain yield, in comparison with the ON-CF method, regardless of the crop seasons/variety. In study by Jain et al. 2013 (DOI: 10.1007/s10333-013-0390-2), however, grain yield in the system of rice intensification (SRI) and Modified SRI methods decreased by 4.42 and 2.2 %, respectively, compared to the conventional puddled transplanted rice (TPR) method. As regards water use, according to e.g. Jain et al. 2013 water saving of 36 % was observed in SRI and MSRI over TPR. And SRI and MSRI increased the water productivity (i.e. the amount of water required per unit of yield) by 45.2 and 48.6 % compared to conventional planting method. Please consider to cite those studies as well in order to ensure more balanced range of science.	Noted with thank. agree that yield is important. However, rice cultivation and emission is site specific, increase and decrease of yield versus mitigation is depend on many and different factors in specific field.	Yurii Pyrozhenko	IPCC TFI TSU	Japan
8575	98	32	98	34	Additional references are needed to the sentence about increasing of nitous oxide emission under dry condition in paddes.	Noted.	Eun Jung Choi	National institute of agricultural sciences	Republic of Korea
41347	98	34	98	34	Re "total GWP": This is not ver precise. I guess you mean the total GWP weigthed emissions - or CO2 equivalent emission. Please consider rewording.	Accepted, to be revised in SOD	Jan Fuglestvedt	CICERO	Norway

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
2917	98	34	98	35	As regards offsetting, season and planting methods can be mentioned as influencing factors. For example, in study by Oo et al. 2018 (https://doi.org/10.1016/j.agee.2017.10.014) the effect of planting methods (young seedlings, wide spacing with alternate wetting and drying irrigation [YW-AWD], old seedlings, narrow spacing with continuous flooding [ON-CF], and in-between the two planting methods [IB-AWD]) were investigated. The results showed that CH4 emission, averaged over rice varieties, reduced for YW-AWD by 41% and 24%, compared with ON-CF, while the reduction in emission for the IB-AWD method was 48% and 26% in summer (dry) and monsoon (wet) season, respectively. In terms of CO2-eq emission, the reduction in CH4 emission was offset by 14.0% and 13.4%, due to an increase in N2O emission from YN-AWD and IB-AWD, in summer rice, and by 10.7% and 10.0% in the monsoon rice, respectively.	Noted, to be revised in SOD	Yurii Pyrozhenko	IPCC TFI TSU	Japan
32163	98	34	98	35	I am unclear of the meaning of this sentence: ' The quantity of N2O emission can not offset the total GWP when combine both gases together. ' I ammune the meaning is that if you convert the CH4 and N2O to CO2e using GWP100 then the methane reduction is larger than the N2O increase. This however does not guarantee that the intervention doesn't cause long term warming, as methane is short lived and N2O long lived. By doing this, you could trade a short term reduction in temperature for a longer term increase in temperature, which is hidden by the use of 'CO2e'. A method that compares temperature outcomes would be required to tell whether such an intervention would be helpful towards the Paris goals.	Noted, to be revised in SOD	Michelle Cain	University of Oxford	United Kingdom (of Great Britain and Northern Ireland)
14895	98	1	100	36	This section has lots of editorial mistakes. Several paragraphs are to be rewritten for more clarity	Editorial	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
3681	98	14			involves and no "with"	Editorial	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
22061	98	16		17	They are four example, namely?	Editorial	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
3683	98	16			which instead of with	Editorial	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
3685	98	25			put the acronym AWD here	Editorial	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
43291	98	25			define AWD	Editorial	Deborah Lawrence	University of Virginia	United States of America
22063	98	27			AWD : Alternative Wetting and Drying ?	Editorial	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
3687	98	30			including	Editorial	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
3689	98	32		34	in the soil (which can… denitrification) it can occur an increase of N2O emission in the field.	Editorial	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
22065	98	32		34	provide data type of soil for N2O emmission in he field	Noted,this sentence is general of	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
38093	98				This section still needs to have grammar checked and edited. It would be worth mentioning that rice straw management is vital in reducing emissions. Rice is responsible for 48% of all global crop emissions, which is largely due to methane from biomass degradation in anaerobic conditions. Just removing rice straw from the field could halve emissions from rice straight away. Declaration of interest: I am director of Straw Innovations Ltd and am leading research and demonstration in gathering and using rice straw in the Philippines. I'd be happy to send more information on this under-researched topic if required. craig@strawinnovations.com	Editorial iaaue. and noted with thank	Craig Jamieson	Straw Innovations Ltd	Philippines
41349	99	7	99	11	Panel c: When you write "net GWP" I guess you mean "GWP weitghed emisions". Please clarify	Noted	Jan Fuglestvedt	CICERO	Norway
22239	99	14	99	14	Missing space after the word "%"	Editorial	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
22241	99	15	99	15	Missing space after the word "%"	Editorial	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
22067	99	1		11	tabel title is too long	Editorial	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
29547	99	5			Carrija et al 2017; Add this article to the reference	It is already in the reference section	RAEHYUN KIM	Institute	Republic of Korea
22423	99	6		11	Indicate in Figure 7.38 if values in X-axis are relative to 1 (no effect)?	Noted	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
3691	99	9			SD: single …	Editorial	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
3699	99	14		17	the meaning is not clear	This paragraph will be rewrite or consider to delete	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
3693	99	14			space needed	Editorial	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
3695	99	15			space needed	Editorial	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
22069	99	17			provide data increasing rice harvested area to date	Noted	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
3701	99	18			is it per year?	This is in 2017 as state above	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
3697	99	19			space needed	Editorial	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
22243	100	1	100	1	Consistency in "et al" for the whole document...with or without a comma	Editorial	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
22245	100	4	100	4	Missing space after the word "%"	Editorial	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
22247	100	5	100	5	Missing space after the word "%"	Editorial	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
22249	100	10	100	10	"resulted of"	Editorial	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
22251	100	10	100	10	Placement of a comma	Editorial	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
41351	100	21	100	21	Re "total GWP": This is not very precise. I guess you mean the total GWP weigthed emissions - or CO2 equivalent emission. Please consider rewording.	Noted	Jan Fuglestvedt	CICERO	Norway
29979	100	25	100	26	In an World Bank Assisted project APIIATP, the water productivity is as base line figure in 2018 and has been targetted to increase from 0.33 kg per cum to 0.42 kag per cum in command area of 1000 minor irrigation tanks covering 90000 heactres of irrigated area in Andhra pradesh state of India	Noted with thanks	sudhanwa patra	Utkal University	India
22253	100	31	100	31	Consistency in "et al" for the whole document...with or without a comma	Editorial	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
22255	100	40	100	40	Consistency in "et al" for the whole document...with or without a comma	Editorial	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
22257	100	45	100	47	Consistency in putting a space after a figure and %	Editorial	Sabaruddin Kadir	Soil Science Department, Fac. of Agriculture, Universitas Sriwijaya, Inderalaya, South Sumatra	Indonesia
12301	100	4	101	14	We need to be concerned about some terms. Measures taken to reduce emissions and linkage of the increased amount of fertilizer application, icreasing N2O emissions, may cause enviromentally unviable and non-profitable means.	Noted with thanks	Mohammad Ibrahim Khalil	University College Dublin	Ireland
3703	100	4			is the first province where AWD first diffusion	Editorial	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
3705	100	5			space after 52%	Editorial	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
3707	100	8			where AWD adoption rate declined. This is due to…	Editorial	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
22071	100	20			Provide data reduce CH4 and N2O emmission	Noted, to be rewrite or delete in SOD	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
22073	100	21			GWP ?	To be clarify in SOD	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
22075	100	22		23	provide data & correlation reduce water by 15% and productivity increase 31%	Noted, to be rewrite or delete in SOD	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
3709	100	22			too much brackets	Editorial	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
3711	100	32			erase "increasing"	Editorial	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
3713	100	52			to enable	Editorial	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
44171	101	5	101	5	From the case studies, it seems possible that including small scale land stakeholders may be able to implement or apply some of the mitigation strategies mentioned. However, there was no mention of poor/under-developed regions and how the governement or related institutions can step it with mitigation protocol to ensure sustainability from ground level.	Noted, to be rewrite or delete in SOD	Tshepiso Mafole	University of Cape Town	South Africa
26957	101	15	101	15	The chapter ends on a case study? There ought to be a closing section to wrap it up.	Noted, to be rewrite or delete in SOD	Louis Verchot	International Center for Tropical Agriculture	Colombia

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
3715	101	2			households	Editorial	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
3717	101	9			what is the meaning of 3,152,852 ?	the unit is in the below sentence. To be changed to proper unit in SOD	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
22077	101	9			IPCC methodology???explain	Noted, IPCC 2006 Gl on National GHG Inventory. To be rewrite for clarification in SOD	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
3719	101	10		14	problem of format of the figures of CO2 emissions.	Noted	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
3721	101	15			The conclusion of the chapter 7 is missing	Noted. to be rewrite in SOD	Catherine MACOMBE	INRAE Institut national de la recherche agronomique et de l'environnement	France
20227	101				If you mention all the different sectors, you should definitely also write something on sustainable livestock	This paragraph focused only on rice field	Henry Neufeldt	UNEP DTU Partnership	Denmark
44173	102	10	102	11	Try and be consistent and write the journal names in full as you did with the other references.	accept, editorial, all references will be checked, updated and complemented with new ones	Tshepiso Mafole	University of Cape Town	South Africa
32221	102	1	129	27	Referencing style is not consistent. Please check. E.g." Zelli, F., Möller, I., & van Asselt, H. (2017). Institutional complexity and private authority in global climate governance: the cases of climate engineering, REDD+ and short-lived climate pollutants. Environmental Politics, 26(4), 669–693. https://doi.org/10.1080/09644016.2017.1319020" and "Zhang, B., H. Tian, W. Ren, B. Tao, C. Lu, J. Yang, K. Banger, and S. Pan 2016, Methane emissions from global rice fields: Magnitude, spatiotemporal pat- terns, and environmental controls, Global Biogeochem. Cycles, 30, 1246–1263, doi:10.1002/ 2016GB005381"	accept, editorial, all references will be checked, updated and complemented with new ones	LOKESH CHANDRA DUBE	NATCOM Cell, Ministry of Environment, Forest and Climate Change, Government of India	India
22425	102		129		There are many missing references cited in this chapter 7. A thorough and careful revision by the authors is needed.	accept, editorial, all references will be checked, updated and complemented with new ones	Santiago (Santi) Sabaté	University of Barcelona and CREAF	Spain
22079	102	1			Reference need more add by the newest jornals	accept, editorial, all references will be checked, updated and complemented with new ones	Rahmawaty Rahmawaty	universitas sumatera utara	Indonesia
29809	102	23			Unable to find citation of this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea
29811	103	30			Unable to find citation of this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea
14899	103	32			DoI incorrect	accept, editorial, all references will be checked, updated and complemented with new ones	Niveta Jain	ICAR-Indian Agricultural Research Institute	India
29813	104	21			Unable to find citation of this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea
29815	104	30			Unable to find citation of this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea
5077	106	14	106	14	Cashore and Howletts……Not cited correctly as a reference	accept, editorial, all references will be checked, updated and complemented with new ones	Sayed Masoud Mostafavi Darani	Iran Meteorological Organization	Iran
29817	106	30			Unable to find citation of this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea
29819	106	41			Unable to find citation of this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea
16855	107	13	107	14	Incomplete reference: '80-' ?	accept, editorial, all references will be checked, updated and complemented with new ones	Ranjith Gopalakrishnan	University of Eastern Finland	Finland
29821	107	9			Unable to find citation of this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea
29823	109	15			Unable to find citation of this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea
29825	109	29			Unable to find citation of this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea
29827	109	38			Unable to find citation of this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea
29829	111	1			Unable to find citation of this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
29831	111	28			Unable to find citation of this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea
29833	111	31			Unable to find citation of this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea
28327	112	18	112	18	According to n° 9, add : Hénault C., Bourennane, H., Ayzac, A., Ratié,C., Saby, N., Cohan, J.P., Eglin, T., Le Gall, C., 2019. Management of soil pH promotes nitrous oxide reduction and thus mitigates soil emissions of this greenhouse gas. Scientific Reports. 9:20182. doi.org/10.1038/s41598-019-56694-3	accept, editorial, all references will be checked, updated and complemented with new ones	catherine Hénault	INRAE	France
28329	112	18	112	18	According to n° 9, add : Hénault C. and Revellin, C. 2011. Inoculants of leguminous crops for mitigating soil emissions of the greenhouse gas nitrous oxide. Plant Soil. 346:289-296. doi 10/1007/x11104-011-0820-0	accept, editorial, all references will be checked, updated and complemented with new ones	catherine Hénault	INRAE	France
28331	112	18	112	18	According to n° 6, add : Mei, K., Wang, Z., Huang, H., Zhang, C., Shang, X., Dahlgren, R.A., Zhang, M., Xia, F. 2018. Stimulation of N2O emission by conservation tillage management in agricultural lands: A meta-analysis. Soil and Tillage Research. 182:86-93.	accept, editorial, all references will be checked, updated and complemented with new ones	catherine Hénault	INRAE	France
29835	112	15			Unable to find citation of this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea
29837	113	11			Unable to find citation of this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea
29839	113	46			Unable to find citation of this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea
28335	114	27	114	27	According to n° 9, add :Sameshima-Saito, R., Chiba, K., Hirayama, J., Itakura, M., Mitsui, H., Eda, S., Minamisawa, K. (2006). Symbiotic Bradyrhizobium japonicum reduces N2O surrounding the soybean root system via nitrous oxide reductase. Applied Environmental Microbiology. 72:52526-2532.	accept, editorial, all references will be checked, updated and complemented with new ones	catherine Hénault	INRAE	France
28333	114	45	114	45	Kassam, A., Friedrich, T.	accept, editorial, all references will be checked, updated and complemented with new ones	catherine Hénault	INRAE	France
29841	114	1			Unable to find citation of this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea
29843	114	13			Unable to find citation of this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea
29845	114	47			Unable to find citation of this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea
29847	115	12			Unable to find citation of this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea
29849	115	42			Unable to find citation of this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea
29851	117	15			Unable to find citation of this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea
29853	117	18			Unable to find citation of this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea
29855	117	20			Unable to find citation of this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea
29857	117	28			Unable to find citation of this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea
29859	118	26			Unable to find citation of this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea
29861	119	24			Unable to find citation of this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea
29863	120	12			Unable to find citation of this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea
29865	120	14			Unable to find citation of this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea
29867	120	24			Unable to find citation of this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea
29869	120	36			Unable to find citation of this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea
29871	120	40			Unable to find citation of this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea
29873	120	45			Unable to find citation of this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea
29875	121	3			Unable to find citation of this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea
29877	121	22			Unable to find citation of this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
29879	121	25			Unable to find citation of this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea
29881	121	35			Unable to find citation of this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea
29883	122	13			Unable to find citation of this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea
29885	123	25			Unable to find citation of this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea
29887	123	40			Unable to find citation of this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea
28337	124	6	124	6	According to n° 9, add :Shabaan M.,Peng, Q., Hu, R., Wu, Y., Lin, S., Zhao, J. 2015. Dolomite application to acidic soils: a promising option for mitigating N2O emissions. Environmental Science and Pollution Research 22 (24), 19961-19970	accept, editorial, all references will be checked, updated and complemented with new ones	catherine Hénault	INRAE	France
29553	124	10			check the year of citation and this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea
29555	125	44			check the year of citation and this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea
29557	126	41			check the year of citation and this article in body.	accept, editorial, all references will be checked, updated and complemented with new ones	RAEHYUN KIM	Institute	Republic of Korea
8617	129	7	129	8	The article that was cited from BRONSON GRISCOM, PETER ELLIS andFRANCIS E. PUTZ, 2014. "Carbon emissions performance of commercial logging in East Kalimantan, Indonesia", Global Change Biology (2014), doi: 10.1111/gcb.12386) is not discussing about Sumatera region at all, the study was carried out in East Kalimantan. I suggest the author to say the certified concessions are better than uncertified. Here I quote from the article cited (Griscom et al 2014): While overall emissions performance in certified and non certified concessions did not differ, emissions per ha from skidding was more than 50% lower in certified concessions". Due to wrong region taken - Sumatera - that categorized as region wide, in fact the right study area is East kalimantan that much smaller than Sumatera, so the scale in Table 7.2 (page 129) is not region-wide anymore	accept, editorial, all references will be checked, updated and complemented with new ones	Jamaludin Malik	FORDA, Ministry of Environment and Forestry	Indonesia
12197		9		13	In addition to policies, payment for ecological services and implementation for all others should be regulated and accountable to make all working to reach the goals.	accept, we will cover ES better	Mohammad Ibrahim Khalil	University College Dublin	Ireland
16645			71	22	when you say "The evidence on whether these programs have reduced deforestation, and hence, forest carbon emissions, are mixed (" this begs for another sentence listing reasons for this like firers, ineffective programs etc	accept, sentence was half finished. we will improve	Bruce McCarl	Texas A & M University	United States of America
12189		22		23	As technologies and measures vary across regions particularly under agricultural systems, location/country/region-specific consdieration are important. Accordingly, implemention approaches and regulations will vary and that the confidence level should be medium.	accept, we will cover better the regional aspects,, space allowing	Mohammad Ibrahim Khalil	University College Dublin	Ireland
16595		22	71		when you say "The evidence on whether these programs have reduced deforestation, and hence, forest carbon emissions, are mixed (" this begs for another sentence listing reasons for this like firers, ineffective programs etc	see 3490	Bruce McCarl	Texas A & M University	United States of America
12191		23		26	Appropriate policies and impelemtation issues should be added.	accept, whole exe summary will be improved	Mohammad Ibrahim Khalil	University College Dublin	Ireland
16619		25		25	Abandonment of agricultural lands and transition into forest being driven by climate changes in productivity at least in some regions. See PhD thesis by CHO Three Essays on Climate Change Adaptation and Impacts: Econometric Investigations texas A&M 2017	thank you for the reference. we will consult it	Bruce McCarl	Texas A & M University	United States of America
16569		25			Abandonment of agricultural lands and transition into forest being driven by climate changes in productivity at least in some regions. See PhD thesis by CHO Three Essays on Climate Change Adaptation and Impacts: Econometric Investigations texas A&M 2017	see previous comment	Bruce McCarl	Texas A & M University	United States of America
12193		27		43	Widfire and its contribution issues should be clearly mentioned somewhere.	we will deal with disturbances better in new section 7.4.	Mohammad Ibrahim Khalil	University College Dublin	Ireland
12199		30		35	We need to be cautious in stating "agricutural intensification and less emission even if improved agricutural practices are adotped. It is suggested to include a few example/brief case study. Percent share is missing	partly accept, we will refine agri sections in new 7.4.	Mohammad Ibrahim Khalil	University College Dublin	Ireland
6083		30		40	30 The impact of mining on deforestation varies considerably between minerals and countries.	partly accept. although statement is vague as a comment. we will improve drivers section.	CARLOS RAMIREZ SANCHEZ-MAROTO	AFA-ANDALUCIA	Spain
16655		32		32	there has been work on mitigation and water quality consideing more than just afforestation - see Water quality co-effects of greenhouse gas mitigation in US agriculture SK Pattanayak, BA McCarl, AJ Sommer, BC Murray... - Climatic Change, 2005 - Springer	thank you for the ref	Bruce McCarl	Texas A & M University	United States of America
16605		32			there has been work on mitigation and water quality consideing more than just afforestation - see Water quality co-effects of greenhouse gas mitigation in US agriculture SK Pattanayak, BA McCarl, AJ Sommer, BC Murray... - Climatic Change, 2005 - Springer	thank you for the ref	Bruce McCarl	Texas A & M University	United States of America
16647		33	71	33	when you say "large and persistent US land-based carbon sink in cropland" the issue is how permanent are these paymnets. Some us crp land went back into cropping	accept, issue of permanence will be dealt with in policy section better	Bruce McCarl	Texas A & M University	United States of America
16597		33	71		when you say "large and persistent US land-based carbon sink in cropland" the issue is how permanent are these paymnets. Some us crp land went back into cropping	see previous comment	Bruce McCarl	Texas A & M University	United States of America
16633		34		34	You might cover the review of evidence on indirect land uses in a paper Market-mediated environmental impacts of biofuelsTW Hertel, WE Tyner - Global Food Security, 2013 - Elsevier	thank you fro ref	Bruce McCarl	Texas A & M University	United States of America

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
16583		34			You might cover the review of evidence on indirect land uses in a paper Market-mediated environmental impacts of biofuelsTW Hertel, WE Tyner - Global Food Security, 2013 - Elsevier	see above	Bruce McCarl	Texas A & M University	United States of America
16639		45		45	Youu might cover bioenergy in the form of electricity a little more as it is the bigger carbon offset. You might also cover time for regrowth (which was omitted from us biogenic carbon stuff) and the possiblility of unifying with carbon capture and storage	thank you	Bruce McCarl	Texas A & M University	United States of America
16589		45			Youu might cover bioenergy in the form of electricity a little more as it is the bigger carbon offset. You might also cover time for regrowth (which was omitted from us biogenic carbon stuff) and the possiblility of unifying with carbon capture and storage	see above	Bruce McCarl	Texas A & M University	United States of America
228					excessive use of abbreviations throughout the text that in many cases are not spelled out at first appearance. Important for the executive summary	accept, editorial	Diego Morgavi	INRAE	France
230					check figures and table numbering throughout	accept, editorial	Diego Morgavi	INRAE	France
6079					Climate change can affect food security in some areas of different countries due to changes in climate, variation in rainfall, and insufficient prevention and protection measures	thank you, we will link better to WGII	CARLOS RAMIREZ SANCHEZ-MAROTO	AFA-ANDALUCIA	Spain
6081					In many regions, yields on some crops (e.g. maize and wheat) have declined, while in others yields on some crops (e.g. maize, wheat and sugar beet) have increased sustainability that contributes to minimizing effects on agriculture, and pastures. This will likely lead to a local disruption of trade	thank you, we will link better to WGII	CARLOS RAMIREZ SANCHEZ-MAROTO	AFA-ANDALUCIA	Spain
6085					31 Metal mining causes significant changes in the environment, including mining facilities and infrastructure	comment i sdistorted partially	CARLOS RAMIREZ SANCHEZ-MAROTO	AFA-ANDALUCIA	Spain
6087					35 Increased gold consumption in developing countries, rising prices, exploitation and illegal trade in auriferos and	comment is distorted partially	CARLOS RAMIREZ SANCHEZ-MAROTO	AFA-ANDALUCIA	Spain
6089					36 uncertainty in financial markets is associated with deforestation induced by	comment is distorted partially	CARLOS RAMIREZ SANCHEZ-MAROTO	AFA-ANDALUCIA	Spain
6091					38 2017, Mirror et al. 2018). The estimated total area of gold mining across the region	comment is distorted partially	CARLOS RAMIREZ SANCHEZ-MAROTO	AFA-ANDALUCIA	Spain
6093					39 increased by approximately 40% between 2012 and 2016 (Asner and Tupayachi 2017). In	comment is distorted partially	CARLOS RAMIREZ SANCHEZ-MAROTO	AFA-ANDALUCIA	Spain
6095					Los conflictos ambientales en Colombia y su incidencia en los territorios indígenas, Rodríguez, Gloria Amparo Editorial Universidad del Rosario 2016, Rueda Gómez, Mauricio Editorial Universidad del Rosario 2016,García Zamora, Rodolfo Editorial Miguel Ángel Porrúa 2015,	thank you for ref	CARLOS RAMIREZ SANCHEZ-MAROTO	AFA-ANDALUCIA	Spain
9397					fig 7.7 to 7.10 are too small to be understood, such as also the others with tables below the pic	accept, editorial	ANNA LAURA PISELLO	DEPARTMENT OF ENGINEERING - UNIVERSITY OF PERUGIA, ITALY	Italy
12289					Both approaches are valid in their own specific contexts, yet both incomplete" and erroneous to some extent until validated at national to regional level to make it globally useful". The latter should be added to complete the sentence.	comment is distorted partially	Mohammad Ibrahim Khalil	University College Dublin	Ireland
13379					. The chapter presents a comprehensive coverage of AFOLU potential contribution to climate change mitigation. The point is made that AFOLU has the potential to contribute to about 23% of total mitigation but this is not clearly explained in the cross-sectoral IPCC logic framework. This is pertinent as the chapter also highlights the crisis as stated in Box 7.2 and the statement in section 7.6 that only 2.5% of climate mitigation funding goes to land-based mitigation options. Clearly the modeling projections do not influence societal actions.	thank you for the comment	Fredrick Owino	Forest Resources International	Kenya
13381					I find the section on bio-energy substitution not adequately covered for the Middle East and African region (MAF) to be not sufficiently covered. The whole area of wood-based bioenergy (including charcoal demands) in Africa calls for more analysis.	comment is distorted partially; still this one is on bioenergy section. we will try to reflect africa better, but are no sure if literature is available	Fredrick Owino	Forest Resources International	Kenya
13383					The section 7.3.2.4 on Agricultural emissions from methane and nitrous oxide needs further amplification extending into regional contributions.	Accepted. This subsection will be revised with emphasis on regional emissions	Fredrick Owino	Forest Resources International	Kenya
13385					Section 7.3.2.5 on "Short lived climate forcers and biophysical effects" is very important consideration. While this is not covered in this version, it deserves more attention climate change projections to 2100.	accept, we will have a section on biophysics and VOCs	Fredrick Owino	Forest Resources International	Kenya
13387					I have some major concerns with section 7.4 on "Policy and socio-economic contexts related to historical trends". This section calls for substantial re-arrangements. Much of what is presented in Box 7.2 should become main text. For example, Hall's (1993) typology of policy changes should set the stage for this section rather than being presented in a box. If necessary, I can offer more substantive editing for this section. Basically, the material is covered very well but I have problem with the way it is presented in this version.	accept, we will revise the box 7.2. make it much shorter and to the point	Fredrick Owino	Forest Resources International	Kenya
13389					Section 7.9 on "Knowledge gaps" is crucial in balanced argumentation. This is usually the punching line of climate change skeptics and it deserves prominence in the final report. The 9 identified sub-sections are pertinent but there is need for thorough review of this section in the next round of reviews.	accept, we will improve this	Fredrick Owino	Forest Resources International	Kenya
13391					The 3 case studies presented are very illustrative and well documented.	thank you	Fredrick Owino	Forest Resources International	Kenya
16687					Selective comments are provided throughout the chapter where there are important references to livestock.	thank you	Hsin Huang	International Meat Secretariat	France

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
18361					Ongoing technological progress, such as precision agriculutre, genetic engineering (including GMO, gene editing), plays the key role for improving agricultural productivity and widely mitigating GHGs from agricultual sector. But this does not be mentioned in Chapter 7. Modify the chapter completely.	accept, the new technologies section needs to be fully developed	Kazuhiko Hombu	Graduate School of Public Policy, The University of Tokyo	Japan
19685					need to have references	accept, editorial	Mochamad Indrawan	Research Center for Climate Change - Universitas Indonesia (RCCC-UI)	Indonesia
22719					There was little treatment of promoting old growth management, retaining older trees and not harvesting them.	accept, we will revise new section 7.4. and include trade offs as well with non-management	Melissa Lucash	Portland State University	United States of America
22721					There was little discussion of the tradeoffs between forests and wildfire risk on C emissions.	accept, we will revise new section 7.4. and include role of disturbances better	Melissa Lucash	Portland State University	United States of America
25525					Please take care not to use value-judgement terms such as 'important', 'significant' and also prescriptive terms such as 'need' and must'. Some readers will interpret these statements as policy prescriptive	accept	Sarah Connors	IPCC WGI TSU	France
25559					As a reader who isnt familiar with all the topics being discussed in your chapter, it might help many Exectutive Summaries to include subheadings to cluster the statements by topic or overarching chapter themes.	partly accept, we will consider headings and sections	Sarah Connors	IPCC WGI TSU	France
25583					For instances where CO2-eq is being used, is it possible to separate out to see methane and nitrous oxide's potential? Given the current discussion along different scientific communities on GWP and other metrics.	accept, we will separate out as much as possible, also fro metrics bow	Sarah Connors	IPCC WGI TSU	France
28813					Section 7.7.4 It is noted that the world should adopt techniques of removing CO2 from the atmosphere or implement NETs, and that to deliver such targets and at the scale needed depends on rapid developments in efficiency, viability, feasibility, acceptability, safety and costs, whilst also ensuring healthy ecosystems, biodiversity protection, food security and environmental sustainability. In addition to these issues, governance of such techniques will be critical in terms of research and development, uptake, deployment and reporting, monitoring and verification – yet governance is not referenced in the text (NB Governance is used here in the IPCC sense i.e., 'A comprehensive and inclusive concept of the full range of means for deciding, managing, implementing and monitoring policies and measures. Whereas government is defined strictly in terms of the nation-state, the more inclusive concept of governance recognizes the contributions of various levels of government (global, international, regional, sub-national and local) and the contributing roles of the private sector, of nongovernmental actors, and of civil society to addressing the many types of issues facing the global community'.	noted; the techniques section needs to be improved a lot	Paul Rouse	Carnegie Climate Governance Initiative	United Kingdom (of Great Britain and Northern Ireland)
29479					A high emphasis has been paid on the positive role of the afforestation and the negative of the defforestation on the C sequestration capacity of the ecosystems all along the chapter. An example of this is presented on Fig. 7.2, in which the CO2 uptake is attributed to the photosytensis of the forests and its litter production, but not to the other production systems like no till systems or perennial pastures and grasses. A lot of evidences and a general agreement in the scientific community about this fact exists, but the particular effects of other land management practices which have been shown to be effective in sequestering C, are less considered. This is the case of no-till systems or the extensive cattle production systems implemented on permanent pastures in the Argentinean Pampas, in which the C emissions are balanced by the high biomass production, increasing the C sequestration of the soils. I am providing a list of references from argentinean authors were these effects have been measured.	accept, we will improve figure	Daniel Buschiazzo	Instituto de Ciencias del la Tierra y Ambientales de La Pampa (INCITAP-CONICET)	Argentina
29481					My native tongue is not English, but I found that the writing of the chapter is somehow complex. The use of metaphores to explain processes in many parts of the text makes the understunding difficult. If the chapters of this report will be read by policy makers of non-english countries it shoud be written in an more simple literature way.	accept, the language will be improved throughout	Daniel Buschiazzo	Instituto de Ciencias del la Tierra y Ambientales de La Pampa (INCITAP-CONICET)	Argentina
29483					Some references of argentinean authors to be considered: Casanovas et al. 1995. Ciencia del Suelo 13:16, and 13: 21; Studdert et al., 1997. S.St.S.A.J. 61:1446; Studdert and Echeverria. 2000. 64:1496: Domiguez et al., 2009. S. Till Res. 102:93; Studdert at al. 2011. Soil Till Res. 117:191; Villarino et al. Agric. Ecosys. Env. 2014. 185:118; Moreno et al. 2016. Spanish J. S. Sci. 6:212; Villarino et al. Sci. T. Env. 575:1056; Villarino et al. 2018. Catena 169:164; Villarino et al. 2019. Ecological Indicators 103:280; Cozzoli et al. 2010. Ciencia del Suelo 28:155; Centurion et al. 2018. Ciencia del Suelo 36:129; Montiel et al. 2019. Ciencia del Suelo 37:281; Alvarez et al. 1995. Soil Till. Res. 33:17; Alvarez et al. 1995. Soil Use Man. 11:45; Alvarez et al. 1998. Agron. J. 90:138; Alvarez. 2001. Soil Use Man. 17:62 and 2005, 21: 38; Alvarez and Alvarez. 2001. Biol Fertil. Soils. 34:282; Steinbach and Alvarez. 2006. J. Env. Qual. 35:3; Berongharay et al. 2013. Geoderma 192: 97; Alvarez and de Paepe. 2019. Soil Res. 57:257; Alvarez et al. 1995. Pesq. Agrop. Bras. 30:701; Alvarez and Lavado. 1998. Geoderma 83: 127; Bono et al. 2008. S.S.S.A.J. 72:1140; Buschiazzo et al. 1991. Z. Pflanzenernähr. Bodenk. 154: 437; Quiroga et al. 1996. Soil Science 161: 104; Buschiazzo et al. 1999. Soil Till. Res. 49: 105; Díaz Zorita, M. et al. 1999. Agron. J. 91: 276; Hevia et al. 2003. Geoderma 116: 265; Buschiazzo et al. 2004. J. Range Man. 57: 511; Urioste et al. 2006. Geoderma 136: 621; Banwart et al. 2014. Carbon Management 5: 185; Iturri et al.2017. Spanish J. Soil Sci.7: 97; Buschiazzo. 2006. Dryland Agriculture, 2nd Ed., Monograph 23: 395; Buschiazzo and Funk. 2013. SCOPE Rapid Assessment Project on Benefits of Soil Carbon. Vol. 71. Chapter 6: 153. Pinto et al. 2017. Agric. Ecosys. Environ. 248 :48; Piñeiro et al., 2012. 8th Int. Conf. Appl. Stable Isotopes Techn. Ecol. Studies (ISOECOL). Brest; Pinto. 2012. PhD Thesis, UBA.	thank you, we will consider them	Daniel Buschiazzo	Instituto de Ciencias del la Tierra y Ambientales de La Pampa (INCITAP-CONICET)	Argentina

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
29485					A process that has not been considered amongts the causes of C emissions is wind erosion. As a matter of fact, this process has not been included in the conceptual C balance of Fig. 7.2. Wind erosion can make an important contribution to C emissions to the atmosphere in arid and semiarid environments.	thank you, we will consider provided there is literature	Daniel Buschiazzo	Instituto de Ciencias del la Tierra y Ambientales de La Pampa (INCITAP-CONICET)	Argentina
29487					Some management practices that can mitigate CO2 emissions in South America were not considered. Some examples are the following: a) the cattle production systems based on direct forage consumtion on permanent pastures, which has been estimated to be a low CO2 emission system due to the increase of the C contents in the soils due to the high biomass production, b) crops production systems based on no-till systems, which have been demonstrated to increase C stocks in the soils, as well as c) cover crops wich are not harvested but remain over the soil surface increasing soil C stocks.	accept, the whole quantification section is being rewritten totally	Daniel Buschiazzo	Instituto de Ciencias del la Tierra y Ambientales de La Pampa (INCITAP-CONICET)	Argentina
29489					An article that describes the ffect of forests on the dry deposition of C in a semiarid environment (pp 8, line 9) is Iturri et al. 2016. Geoderma 264: 42.	thank you for ref	Daniel Buschiazzo	Instituto de Ciencias del la Tierra y Ambientales de La Pampa (INCITAP-CONICET)	Argentina
31579					The structure First Draft of Chapter 7 under review entails structural finesse crafted by experts and all major components of AFOLU bear close sequential continuity, consistency and proven cogency between past knowledge and fresh research essential for future projections.	thank you	Arvind Kumar	India Water Foundation	India
31581					Comprehensiveness This chapter is comprehensive in its coverage of the components of AFOLU along with their attendant barriers and opportunities along with adequate emphasis on the potential of these components in impacting climate change positively as well as negatively. Minutia of details of all aspects makes this chapter all-embracing	thank you	Arvind Kumar	India Water Foundation	India
31583					Balance of the Assessment Latest data coupled with scientific evidence along with enabling future projections about AFOLU vis-à-vis climate change envisages a semblance of academic equilibrium in the overall assessments in the chapter	thank you	Arvind Kumar	India Water Foundation	India
31585					Overlaps There is no overlap of either facts or assessment in the chapter under review.	thank you	Arvind Kumar	India Water Foundation	India
31587					Inconsistencies Having read in between the lines of this chapter, no inconsistency either of logical interpretation or data analysis has come to notice.	thank you	Arvind Kumar	India Water Foundation	India
31589					Gaps in the Assessment Assessment of each theme of the components of AFOLU is interconnected with other component and leaves no room for any gap(s). While building on IPCC's Special Report on Land Use of 2018, this chapter is a fine blend of past and current scientific research.	thank you	Arvind Kumar	India Water Foundation	India
31591					Proposed Revisions This reviewer feels no need for revision of this chapter as it is in present format because it is self-sufficient and self-contained. Possibly need could rise only if new facts come to light before going to the press.	unclear	Arvind Kumar	India Water Foundation	India
31593					Shortening the Text Coherent and cogent treatment of the major themes pertaining to AFOLU do not warrant shortening any part of this chapter and any attempt to do so is prone to mar its lucidity, academic and scientific credibility. The final draft after some editing will make it a still better chapter.	accept, editorial	Arvind Kumar	India Water Foundation	India
33073					Figure footnotes should be written in the same format.	accept, editorial	Mirzokhid Mirshadiev	Wageningen University and Research	Netherlands
33103					I would suggest to include partnership and international cooperation to develop effective AFOLO sectors and monitoring mechanism for monitoring progress towards mitigation	accept, we will align better with ch on int cooperation	Edris Alam	Rabdan Acadmey	United Arab Emirates
35089					1. List of abbreviation is missing	accept, editorial	Happiness Nnko	The University of Dodoma	United Republic of Tanzania
35091					2. Figure labeling throughout the document need consistency	accept, editorial	Happiness Nnko	The University of Dodoma	United Republic of Tanzania
35093					3. Citation in the text need consistency	accept, editorial	Happiness Nnko	The University of Dodoma	United Republic of Tanzania

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
35095					For example	accept, editorial	Happiness Nnko	The University of Dodoma	United Republic of Tanzania
35097					page 7-13 line 6 (Wear and Greis 2013, Galik and Abt 2015) and page 7-15 line 29 (Abrahão and Costa, 2018), page 7-16 line 6 (Strapasson et 2017), line 10 (Alexander et al. 2015) line 14-15 (Muratori et al 2016), line 43 (Davis et al., 2015) Page 7-17 (Pfaff et al. 2007, Rudel et al. 2009, Ferretti-Gallon and Busch 2014) and line 9-10 (Laurance et al. 2009; Alamgir et al. 2017)	thank you for the refs	Happiness Nnko	The University of Dodoma	United Republic of Tanzania
35099					4. Staring a paragraph need consistence for example Page 7-93 line 41 and 47	accept, we will improve chapter throughout	Happiness Nnko	The University of Dodoma	United Republic of Tanzania
40147					Rangeland is the forage base for most of the livestock industry, but just as importantly it provides wildlife habitat, recreational opportunities, and off-site water for millions of people of the world. The impact of climate change and overgrazing on the vegetation of rangelands is not hidden. In this chapter, a story about the impact of climate change for long-term grazing capacity, why are not mentioned? This implies that global food security and supply protein. I think this debate should be added to the chapter and also to be seen in the scenarios.	accept, we will improve chapter throughout	Mohammadreza Najibzadeh	member of scientific board of ANRC and Ph.D candidate in Tehran University	Iran
40321					Chapter 7 authors should strive for more conceptual clarity around what ecosystem-based approaches are, and which ones are actually good for the climate, biodiversity, and communities on the ground. The various AFOLU approaches for drawing down CO2 still get lumped together way too much. For instance: The restoration of natural ecosystems, if implemented with human rights and ecosystem safeguards, does not come with the same risks and side-effects that inevitably come with BECCS and monoculture afforestation. Those differences should come out much more clearly in the Executive Summary. The 2019 IPBES report is useful guidance for a coherent integration of climate, biodiversity, and human rights concerns.	accept, we will improve chapter throughout	Linda Schneider	Heinrich Boell Foundation	Germany
40323					At the beginning of the Executive Summary, you write that the expectation on land to deliver mitigation is very high. It would be useful to make very clear that the primary potential for mitigation must come from avoided emissions from deforestation. In the recent hype around „Nature Based Solutions" it sometimes gets lost that planting trees is not a silver bullet, especially not if emissions from deforestation of existing carbon-rich forests continues. It would be helpful to point out the order of priorities of what needs to happen in the land sector, and to address them in different subsections rather than in the same one (such as on p. 4 lines 23-39).	accept, we will improve chapter throughout	Linda Schneider	Heinrich Boell Foundation	Germany
40327					There should be a strong mentioning of the role of protecting land tenure rights, in particular those of Indigenous Peoples and local communities, in protecting ecosystems and thereby carbon stocks. - over 1/3 of the carbon identified in community lands across the tropics lies in areas without secure tenure rights (Climate, Land, Ambition & Rights Alliance 2018)	accept, we will improve chapter throughout	Linda Schneider	Heinrich Boell Foundation	Germany
40329					It would be good to get more information on the mitigation potential of non-industrial agricultural practices, such as a shift to agroecology and agroforestry. The Climate, Land, Ambition & Rights Alliance in their 2018 report „Missing Pathways to 1.5°C" finds that there is additional mitigation potential in transforming agriculture: https://www.climatelandambitionrightsalliance.org/report	Noted. The authors thank the reviewer for their suggestion. The section on mitigation will be extensively revised and consideration will be given to the reviewer's comment during revision.	Linda Schneider	Heinrich Boell Foundation	Germany
43947					The balancing (considering synergies and trade-offs) between the contributions of AFOLU to mitigation as well as its contribution to biodiversity conservation needs to be included and addressed under the question: How can mitigation efforts and mitigation efficiency by the AFOLU sector, the associated restoration of natural ecosystems (reforestation and others) as well as afforestation be balanced with / benefit from the desired stabilization and recovery of biodiversity. Coordination with WGII chapter 2 as well as development of a Cross Working Group Box on Biodiversity and ecosystem services should be investigated.	accept, we will improve chapter throughout	Hans Poertner and Elvira Poloczanska	Alfred-Wegener-Institut	Germany
46311					Feliciano et al. (2018) is cited in the chapter but not included in the reference list	accept, editorial	Diana Feliciano	University of Aberdeen	United Kingdom (of Great Britain and Northern Ireland)
46361					The chapter should introduce the topic of land capability. This is essencial in terms of understanding the land capabiliy to mitigate and adapt under current and future climate conditions. Land capability is widely used and familiar to planners and land managers, it has policy relevance, for example in terms of protection of 'prime agricultural land', it is very important in the international context as it is connected to UN FAO Guidelines on Land Evaluation. Land capability can help put climate change into context as it is a reference system to map and interpret change, supports the assessment of the implications for different land uses and it can be used as a strategic planning tool. Good references to approach the topic of land capability are: Brown, I, Castellazzi, M (2015) Changes in climate variability with reference to land quality and agriculture in Scotland. International Journal of Biometeorology, 59, 717-732; Brown, I (2016) Climate change and soil wetness limitations for agriculture: risk assessment framework with application to Scotland. Geoderma; Brown (2017) Bioclimate zonation to reference climate change across scales. Applied Geography.	comment is distorted partially	Diana Feliciano	University of Aberdeen	United Kingdom (of Great Britain and Northern Ireland)

Comment ID	From Page	From Line	To Page	To Line	Comment	Response	Reviewer Name	Reviewer Affiliation	Reviewer Country
46363					The chapter is very descriptive. It is well written and it revises the last literature available (with some important gaps, as for example, on land capability) but it should move from a descriptive approach to a more solution-based approach. What works, where, what are the barriers, how to overcome the barriers, which policies are more effective, where, how can land capability support decisions on land use management and help to interpret change, what do we know about stakeholder behaviour in terms of implementation of mitigation and adaptation practices, how does culture influences this.	accept, we will improve chapter throughout	Diana Feliciano	University of Aberdeen	United Kingdom (of Great Britain and Northern Ireland)
46365					There are many literature criticising land intensification and this should be acknowledged. New research suggests that the combined social and ecological results of increased agricultural intensification in low and middle-income countries are not as positive as expectedFor example: Rasmussen et al. 2018. Social-ecological outcomes of agricultural intensification. Nature	accept, thank you for the ref. we will balance these aspects of intensification	Diana Feliciano	University of Aberdeen	United Kingdom (of Great Britain and Northern Ireland)
46497					Generally the chapter needs more socio-cultural and political-economic analysis of drivers of deforestation, impacts of mitigation and vulnerability of particular groups.	accept, drivers will be rewritten	Rachel Bezner Kerr	Cornell University	United States of America
46499					Generally the chapter does not fully assess the literature on deforestation drivers or mitigation tradeoffs; the regional discussion needs more evidence statements, and a broader range of literature included in the assessment. See for example this paper on agroforestry tradeoffs and synergies: Tschora, H., & Cherubini, F. (2020). Co-benefits and trade-offs of agroforestry for climate change mitigation and other sustainability goals in West Africa. Global Ecology and Conservation, 22. https://doi.org/10.1016/j.gecco.2020.e00919	accept, the rivers section will be rewritten	Rachel Bezner Kerr	Cornell University	United States of America
47735					My message is: that a recent (Nov 2019) biochar publication should be referenced - especially re LCAs (Life Cycle Analyses). In Chapter 7. Section 7.5.8, p 59-60 The non-fee cite is: Potentials, Limitations, Co-Benefits, and Trade-Offs of Biochar Applications to Soils for Climate Change Mitigation by Alexandre Tisserant * and Francesco Cherubini; Open Access Land 2019, 8(12), 179; https://doi.org/10.3390/land8120179 Ronal W. Larson , PhD	Accepted, reference added	Ronal Larson	Larson Consulting	United States of America
48037					From ES : please explain clearly what differs from the assessment in SRCCL and why	accept, we will refine the exe summary and link it better to new material and insights	Valérie Masson-Delmotte	CEA, IPSL/LSCE	France
48039					ES : please coordinate with WGI, chapters 5 and 6 for emissions and natural sinks	partly accept, this was based on SR land. we will update based on latest from WGI	Valérie Masson-Delmotte	CEA, IPSL/LSCE	France
48041					ES : please check reduced rates of deforestation for some regions	accept, we will update	Valérie Masson-Delmotte	CEA, IPSL/LSCE	France
48043					ES : please see my comment on the full report. Coordination is needed between WGI and WGIII for a full assessment of the biogeophysical aspects of afforestation / reforestation (including biophysical feedbacks) + potential so as to provide a clear synthesis (in a context where some countries / sectors not keen to reduce emissions related to fossil fuels are pledging to plant millions of trees)	accept we will include a section on biophysical aspects, Luyssaaert as a CA	Valérie Masson-Delmotte	CEA, IPSL/LSCE	France
48045					The ES provides almost no conclusion related to CH4 and N2O mitigation specificities (strong focus on CO2). I would expect a discussion of new metrics such as GWP* (coordination with WGI needed).	accept, we will improve	Valérie Masson-Delmotte	CEA, IPSL/LSCE	France