

IPCC SRCCL Second Order Draft Review Comments and Responses - SPM

Comment No	From Page	From Line	To Page	To Line	Comment	Response
33433	0	0	0	0	<p>Not a single figure or table or box is correctly indexed. Correct would be 'Figure SPM.8: ' or 'Table SPM.1: ' or 'Box SPM.1: ' (NOT 'Figure SPM 8:', and NOT 'Table SPM 1: ', and NOT 'Box SPM 1: ').</p> <p>Please note, I have distributed to all TSUs many months ago a checklist to be used right before finalizing and releasing a draft such as the SPM. It is one page only and that would help to avoid these errors. The back side contains example, that may also help greatly to have a quick look at when finishing a draft. This document should have been distributed to all TSU staff and best also to all chapter scientists to make sure a draft is formatted correctly before it is released. [Andreas Fischlin, Switzerland]</p>	addressed during copyediting
33479	0	0	0	0	<p>Many of the SPM statements (in some parts the majority) are not tenable in the current form. Many lack a careful assessment, beginning with the actual statement formulation, which often does not withhold scrutinization. This seems also to come from the fact that the assessment behind is lacking substance. Moreover, many of these statements are disconnected from the underlying text and not traceable account can be found at this stage. Authors need to very carefully reconsider and overhaul in its entirety significant parts of the SPM. Finally uncertainly language is in these cases also still mostly lacking, yet will be needed dearly. [Andreas Fischlin, Switzerland]</p>	SPM text has been comprehensively redrafted with improved use of confidence language and line of sight
1665	0	0	0	0	<p>The report needs to strength adaptation of climate change, which can also be analyzed by 2 parts: supply-side and demand-side. Moreover, because of the complexity of adaptation, it can be analyzed with multi-angle, such as global initiatives, NAPA, small-holder farm adaptation, CbA, EbA, incremental adaptation, transformational adaptation. [Chao WEI, China]</p>	Adaptation has been included where justified by the underlying report
14523	0	0	0	0	<p>This SPM refers in several places to a 'land degradation neutrality target' (e.g. pg 30, ln 38). First the meaning of 'land degradation neutrality' is not defined anywhere in this SPM. Second, the SPM does not make clear whose target this is - I had to go to other sources to find that this is a target under the UN Convention to combat desertification. Third, it is not clear if this target only relates to arid land subject to desertification, of if it also applies to preservation of natural systems in the tropical, boreal, temperate and tundra climatic zones. As shown e.g. in Figure SPM.6 reduced deforestation and forest degradation have substantial mitigation potential and most of this forest is not in arid zones. [, Canada]</p>	accepted - LDN has been described
14525	0	0	0	0	<p>This report deals with sustainable land management, but while these factors are included in Figure SPM.6, the text does not discuss the potential benefits of preserving intact natural ecosystems (such as peatlands or forests), for maintaining carbon stocks of wildlands and reducing greenhouse gas emissions. The most relevant item on this appears to be C2.4, which discusses 'achieving the target of land degradation neutrality', but the meaning of this is not explained. [, Canada]</p>	noted
14527	0	0	0	0	<p>The SPM lacks references to water management (which could be added to the graphic on p.4 - adaptation sub-bullet, p.6 line 45, p.21 line 20) or effects of extreme events. [, Canada]</p>	Water management has been addressed where justified by the underlying report
4393	0	0	0	0	<p>the SPM has all the relevant information/key messages pulled through that we would wish to see given the constraints of the process, but it needs editing to remove duplication, manage inconsistencies in language and terminology and streamline the text. [, New Zealand]</p>	noted - SPM has been comprehensively redrafted
4395	0	0	0	0	<p>The diagrams are very useful, but for policy makers not familiar with some of the more technical aspects these may need to be further described to make them fully useful. [, New Zealand]</p>	SPM figures have been comprehensively redrawn with extended explanatory material

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777	0	0	0	0	Spain would like all paragraphs in the SPM to have a confidence level associated to the statements included. If these confidence levels are not added in all paragraphs we would ask to delete those paragraphs that don't have a level associated. [Spain]	Noted. Confidence levels have been included
32657	0	1	0	1	SPM: I fully subscribe to the comments submitted by the Government of Belgium [Jean-Pascal van Ypersele, Belgium]	noted
40361	0		0		After reading all chapter drafts, I see a potential to deeply improve the SPM if executive summaries from chapters build on core material to provide more substantiation to key findings, including regional information / case studies. We generally miss inputs from all cross-chapter boxes which do not have explicit key findings expressed. [Valerie Masson-Delmotte, France]	noted. SPM text has been comprehensively redrafted
40363	0		0		I see a major challenge in the current SPM in the treatment of climate change (e.g. trends, maps). It fails to highlight which aspects of human induced climate change are already affecting land aspects, and to highlight confidence in changing hazards driving future risks. There are elements related to attribution in chapters, but they need to be sharpened and conveyed in the SPM. The text linked to climate change is very generic and lacks clear information about implications of various levels of warming, or various scenarios. [Valerie Masson-Delmotte, France]	noted. SPM text has been comprehensively redrafted
40365	0		0		There are two questions about the report that the SPM has to cover : what is new since previous reports (SR15 and AR5/SREX); and why is it relevant. Thinking of the audience is important. What is relevant for international, national, sub national decision makers? For various activity sectors? [Valerie Masson-Delmotte, France]	noted. SPM text has been comprehensively redrafted
40367	0		0		Pressure on land due to fiber production is mostly missing in the whole report and the SPM. Amongst major crops worldwide cotton may also be considered, in relationship with the adaptation and mitigation challenges, and in relationship with the textile / fashion industry, where issues such as growing consumption, duration of use, waste, are also relevant for this report on climate change and land in addition to food aspects. [Valerie Masson-Delmotte, France]	Noted
40373	0		0		Why is the anthrome framing from Chapter 6 absent in the SPM? [Valerie Masson-Delmotte, France]	Noted
40377	0		0		The SPM may be easier to read if confidence would be expressed as often as possible using only confidence levels (not agreement and evidence). [Valerie Masson-Delmotte, France]	use of confidence language has been revised
40381	0		0		The SPM is weak on the following issues : irreversibility / non linearities; role of soils (maybe a box would be relevant, as it is highly cross cutting); gender aspects (which are covered in almost all chapters but not that clearly in their executive summaries hence the lack of visibility in the SPM). [Valerie Masson-Delmotte, France]	noted. SPM text has been comprehensively redrafted
40383	0		0		The SPM needs to be designed with an overarching view of the relevant climate hazards (missing, dispersed). Several notions are not explicitly defined, and a concise glossary would be helpful for the SPM reader. [Valerie Masson-Delmotte, France]	noted. SPM text has been comprehensively redrafted
40395	0		0		Check for appropriate assessment of links between demography, pressure on land, and climate change as this issue is addressed / touched in different chapters with different angles and approaches. It is relevant for the SPM. [Valerie Masson-Delmotte, France]	now captured in figure sPM 1
40409	0		0		The SPM could highlight the importance of education, training, social learning for land transitions . There is material in almost all chapters but not always captured in ES statements. [Valerie Masson-Delmotte, France]	Thank you for your comments. Sections C and D of the SPM final draft emphasise the need of capacity building strategies.

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40411	0		0		The SPM does not fully capture : limits to adaptation and residual risk (loss and damage); cost of adaptation or mitigation (there are elements in chapters); information relevant at the scale of a farm; sea level effects; cryosphere effects. [Valerie Masson-Delmotte, France]	noted. In part addressed by revision to Figure SPM2
40483	0		0		The SPM could provide more insights on urban aspects. At the moment they are distributed across chapters with overlaps/ repetitions and potential inconsistencies (green infrastructure, urban diets, urban effects on regional / local climate, urban land footprint, potential for adaptation and mitigation etc). [Valerie Masson-Delmotte, France]	Noted
229	0	12	30	14	Please add - as global mean temperature increases, tropical and sub-tropical regions will see the emergence of hot climate zones in areas where rainfall dramatically decreased in addition to hot waves, drought, desertification. [Ali Geath Eljadid, Libya]	Addressed in revised SPM Section A
32685	0				The Government of Belgium would like to express its appreciation for the very large amount of work that went into the preparation of this report. We find however that the SPM is too long. As we suggested before, 10 pages would be fine ! [, Belgium]	The first draft SPM was just under the IPCC recommended word length
32687	0				There are many (and complex, big and long) figures in the SPM. We suggest to reduce the number and overall simplify. [, Belgium]	Figures have been considerably developed
32703	0				There is a lack of consistency with respect to the indication of the level of confidence and evidence. It needs to be more consistently reported in the next version of the SPM. The relation of the "confidence" scale to agreement and evidence should be explained (Figure 1 of the IPCC uncertainty guidance note from Jasper Ridge?). In addition, there are some paragraphs without any evaluation of confidence or agreement. [, Belgium]	use of confidence language has been revised
32705	0				Would it be useful to clarify that the SPM only looks at the potential co-benefits of CC actions for biodiversity and the negative impact of CC on biodiversity, but doesn't mention the potential of biodiversity in the fight against CC (so the other way around). Biodiversity conservation/restoration and CC mitigation/adaptation measures can be mutually supportive if addressed correctly. In other words, biodiversity can be part of the solution, not merely an additional positive outcome of CC mit/adapt. [, Belgium]	noted - the SPM has been redrafted to give appropriate weight to a range of issues
21851	0				We would propose to consider adding to the SPM a short summary of the role of sustainable forest management for mitigation and adaptation, for example under section B. Adaptation and mitigation response options, as the information on this topic is currently a bit scattered across the report, making it difficult to formulate an overview. [, Finland]	Noted
6321	0				Thank you to the authors - a lot of work has gone into the report and SPM and it contains a lot of highly valuable information. We look forward to the next iteration. Some areas to improve include tightening the structure so that it flows in a clear and easy-to-understand way, reducing repetition and building on the findings of SR1.5. Also the SPM would benefit from more specific information about adaptation and limits to adaptation. [, Gambia]	Noted
6323	0				Given the importance of reducing deforestation, it would be helpful to have more information in the SPM on the urgent need to reduce deforestation, and the co-benefits of doing so. What do pathways for 1.5°C show with regard to deforestation? [, Gambia]	Noted - in part addressed by the revised Figure SPM 4
6325	0				The SPM tends to focus on the challenges faced by land in the context of mitigation, but in comparison it does not contain so much on its potential for adaptation or on limits to adaptation. It would be helpful to correct this tendency in order to reequilibrate these aspects. [, Gambia]	Adaptation has been included where justified by the underlying report

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27503	0				The evidence provided in all chapters regarding the impacts of climate change and the benefits and trade-offs of mitigation and adaptation measures on the SDGs should be more explicitly mentioned in the SPM. The "translation" of the scientific outcomes of the SRCCL into the SDG language could ensure the consistency between this report and the SR1.5. [, Germany]	Thank you for your comment. The redraft of the SPM took serious attention to draw messages consistent among all Special Reports of the AR6, including the SR15C.
27505	0				The SPM currently doesn't reflect the discussion on differences between model- and inventory-based assessments of GHG fluxes contained in chapter 2 (e.g. ES p5 lines 26-45). We strongly encourage the authors to incorporate the main findings and a short discussion on their policy relevance to the SPM. [, Germany]	An explicit discussion of this has been included Section A4
27507	0				It would be extremely useful for policy makers if core concepts and definitions central to this report could be introduced in a box, similar to the SR1.5. This would include introductions of land types and land management options. [, Germany]	accepted - this need is covered by new figure SPM 1
27509	0				We urge the authors not to scatter the discussion of CDR across several sections. Sections B3 and B4 should please be complemented with the information on its sustainability which is currently addressed in section A1.4 (drawing on chapter 1). It is also very important to inform the reader of the scientific uncertainty associated with CDR-options (e.g., their technological potential and risks, shortcomings of scenarios and IAMs) that is discussed in chapter 1. We suggest that the authors consider dedicating one specific section to CDR by merging sections B3 and B4, which both address mitigation effects on land and have strong overlaps, with paragraph A1.4, in order to provide the full picture of CDR to the reader. [, Germany]	new section on CDR has been included. Section B5
27511	0				Please provide an explanation for the baseline scenario in Figure SPM5, Table SPM.1 as well as the business-as-usual scenario mentioned in B5.4. Are these the same? [, Germany]	This figure has been removed.
27513	0				We consider the inclusion of high quality tables and graphs/figures in the SPM that are particularly tailored to the SPM's wider audience - often not with a scientific background - a key instrument for efficiently and effectively communicating the SRCCL's most important findings. Visualisation of findings in a synthesizing manner without overgeneralizing complex issues too much in each section of the SPM would be extremely helpful. Therefore, we appreciate the diversity of the material included in the draft SPM and make substantial comments in support of further improvements. Generally, figures and tables in the SPM should be easier to understand for policy makers and other non-expert audiences of the SPM. Figures should convey key findings of the report and be usable in presentations for outreach. The information provided should please be supported by clear explanations in the legends and supplement the main text. Please do not use any jargon (e.g. RCP2.6, or 1.5x1QR, low-carbon diet). [, Germany]	Thank you for your comment. The SPM final draft figures have been re-drafted.
27515	0				We appreciate that the SPM provides overviews about the GHG mitigation potentials of different options and on their side effects and barriers. However, in the current draft this information is presented in different ways in Figures SPM.6 and SPM.7 (mitigation potentials) and in Table SPM.1 (side effects). We strongly encourage the authors to provide this information in a similar form so that the figures can be compared. It would be useful to first show the potentials of response options and then their side effects, in the current draft the order is reversed. Please provide confidence levels (as in Table ES 2.1) on your findings. It would also be extremely helpful if the authors could provide an expert judgement about the implications for climate resilient development / sustainable development and about the barriers that are associated with individual mitigation options. [, Germany]	Figures have been considerably developed

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27517	0				Section C does not add substantial value and contains a lot of duplications with sections A and B. In addition, it is surprising that SLM is only addressed in detail in section C and not mentioned in the previous sections in an integrated manner and linked to mitigation/adaptation. We therefore suggest merging relevant content from section with sections A and B, and to delete section C. If section C was kept, we suggest merging C1, C2, and C4 as there is much duplication. [, Germany]	Sections C & D have been comprehensively revised to minimise overlap and duplication
27519	0				In the current draft of the SPM, migration is only mentioned in the context of desertification and slow onset events. As migration is highly policy relevant it would be useful to further elaborate this issue including providing information on the link between migration and extreme events as addressed in table 7.1. [, Germany]	Noted
27521	0				We strongly encourage the authors to make specific and if possible quantitative statements in the SPM. While we recognize that the need to provide synthesis findings at the global level in the SPM makes this request challenging to implement, the readers would even more profit from the SRCCL. [, Germany]	use of quantified statements has been improved
27523	0				The current headline statements often provide very general information that does not fully represent the more detailed findings in the underlying sections. When revising the SPM, please make sure that the headline statements contain specific, if possible quantitative, information and taken together present a narrative of those findings from the SRCCL that are of most eminent concern to policymakers. [, Germany]	noted
27525	0				Despite a number of interesting findings in the underlying report on the important role that insurance (particularly index-based) can play to increase the financial resilience against weather extremes and the incentives for risk reduction efforts (e.g. sections 1.4.3, 5.3.2.2, 7.5.2 and 7.5.3.5), the SPM has not given appropriate space for this. [, Germany]	noted
33783	0				Generally, we feel that it would be beneficial if the SPM could introduce fundamental specificities for land-climate interactions. Such specificities include: - Systems are dynamic and cyclic (i.e. in flux) compared to emissions from fossil sources which are more permanent (i.e. stock emissions). - Exchanges of water, energy, greenhouse gases are happening irrespective of human impact. Thus human impacts are not easily separated from natural fluxes. - Systems are integrated with each other, implying that interventions will have a set of impacts which may lead to other outcomes than expected. [, Norway]	partly accepted - the new version figure SPM 1 goes some way to addressing this
33785	0				We suggest that you consider to give higher priority in the SPM to describe findings related to gender (gender and equity, access to land, decision-making, mitigation and adaptation see ch. 5.2.5.1 and ch. 7 Box 6 etc.). These issues could also be described more in the Executive summaries of the individual chapters. [, Norway]	noted - the SPM has been redrafted to give appropriate weight to a range of issues
33787	0				We suggest that you consider to give higher priority in the SPM to describe findings related to indigenous peoples (not only related to IK but also to governance decision making etc.) (see e.g. ch. 6.4.2.3, that describes that 370 million indigenous people control around 38 million hectares of land and many have insecure tenure, relevant information in FAQ 7.1 and ch. 7 page 61-63). In addition, ch 7.6.1.1 and 7.6.1.2 page 76-77 brings forward relevant information regarding the decision-making process. These issues could also be described more in the Executive summaries of the individual chapters. [, Norway]	noted - the SPM has been redrafted to give appropriate weight to a range of issues

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33789	0				We suggest that you consider to give higher priority in the SPM to describe findings related to poverty and climate change and land e.g. ch 6.4.2.2, that describes that 65% of poor working adults make a living through agriculture which illustrates that the climate and land issue are important for poverty). These issues could also be described more in the Executive summaries of the individual chapters. [, Norway]	noted - the SPM has been redrafted to give appropriate weight to a range of issues
33791	0				For us it is somewhat unclear in the draft SPM how water management coincides with the concept of land management. We see freshwater management as an intrinsic part of sustainable land management, especially when it comes to agricultural practises and food security. Please consider to explain better to the readers of the SPM how water management and availability are dealt with in the context of sustainable land management. [, Norway]	noted - the SPM has been redrafted to give appropriate weight to a range of issues
33793	0				The SPM should be readable and understandable to as many as possible. In the current draft there are lots of examples of language that are in our opinion of a to academic, technical or complicated nature. Please consider to find easier and more understandable synonyms for such terms e.g. inextricably, albedo, siltation, Rangeland, ameliorate, accrue. [, Norway]	a comprehensive glossary is provided
33795	0				General comment: Please consider including the expected contribution of internation collaborations through capacity building, knowledge and experience sharing, technolgy transfer, and adaptation are important components to secure sustainable land management. [, Norway]	noted - the SPM has been redrafted to give appropriate weight to a range of issues
33797	0				Please consider including information regarding land sparing versus land sharing because these are important concepts for sustainable land resources management and maintaining the balance of increasing demand for food and other items in a sustainable ways (exensification vs. intensification) (Cross Chapter Box 5, figure 1). Please refer to https://doi.org/10.1111/conl.12084 article for further information related to this concepts. Please consider also including how livestocks and grazing land management contribute reducing GHG and maximizing carbon pools. [, Norway]	noted - the SPM has been redrafted to give appropriate weight to a range of issues
33799	0				Generally, the SPM does not fully succeed in its purpose to give important key messages to policy makers. Much of the text presented in sections A and B is information that is already known, while sections C and D is mostly discussing considerations that must be made, while real take-home messages from the main report are not so apparent. One example on how to improve the SPM could also be to check if the main objectives of the report as outlined in Chapter 1.2 page 6 line 4-14 is sufficiently covered. Generally, the SPM mostly explores point 3 (i.e. in SPM section B), and the second part of point 4 (i.e. in SPM section C and D), while even this mostly lists issues for considerations. [, Norway]	noted
33801	0				General comment: Justify how the strategy and scale of implemetation of CDR e.g. BECCS and afforestation affects food security, deforestation, land degradation and ecosystem functioning, especially water supply or consider including the summary of section 7.3.3.2 (Risk assocaiated with land-based mitigation). [, Norway]	addressed in new section B5

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33985	0				Generally we feel that the draft of the report, and especially the chapters themselves are filled with information that is useful and informative. However when information is aggregated to the SPM level your conclusions have a tendency to be overaggregated to the extent that they become less useful for policymakers. Please look closer at the formulations that are currently in the executive summaries of the chapters themselves, and try to pick up the most relevant, quantitative and concrete findings from that level when further developing the SPM. [, Norway]	SPM has been redrafted to increase the use of specific and quantified statements
29629	0				Overall the SPM is in a rather good shape for a FOD and contains many very informative statements. However, some work is required in order to present to policymakers an even clearer and more balanced view of the diverse challenges faced by land systems in the context of climate change. [, Saint Lucia]	Noted - SPM text has been comprehensively revised
17515	0				Please use the calibrated uncertainty language in a consistent manner. All statements should be accompanied with an assessment. "Low confidence" statements should be avoided, unless it is well explained how the considerable uncertainty is a major policy-relevant finding. Also, in many occasions, the SPM draft cites both Agreement and Evidence (from A2.2 and onwards), rather than collapsing this to a Confidence level, which would be more in line with the calibrated uncertainty language. Please revise throughout, as appropriate. [, Sweden]	Noted
3849	0				Some terms (e.g. "no-regret") should be included in the Glossary [, Switzerland]	Noted
3851	0				It is not clear which models (e.g. those of the AR5 - RCPs -, or those of the SR 1.5, etc.) are used for the projections [, Switzerland]	descriptions of models has been clarified in revised SPM
3853	0				The SPM does not contain much information of the impacts of climate change on human settlements, which are also on land. [, Switzerland]	Noted
3855	0				Section D is most welcome. Nevertheless, a way has to be found to convey the message that while action has to start immediately, it may be long-lasting (e.g. land restoration). [, Switzerland]	Section D has been comprehensively rewritten
3857	0				The way the SPM uses "desertification" does not show the anthropogenic responsibility in it. In other words, one has the impression that human actions do not contribute to desertification. Can this lack of clarity addressed? [, Switzerland]	desertification headline statement has been redrafted
20943	0				There are a number of terms that have been included in the Summary for Policy Makers which are technical in nature, and should either be explained in the text or defined in some form of glossary. These include biogeochemical, land degradation, desertification, evapotranspiration, agroecosystem, agroclimatic, agrobiodiversity, agro-meteorological, non-food cash-crop production and second generation bioenergy crops. [, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. These terms are included in the glossary
20945	0				Much of SPM is missing confidence statements for example most of page 12, section B4 and all of section C1. Could these be included if possible and their application be consistent throughout the SPM? [, United Kingdom (of Great Britain and Northern Ireland)]	use of confidence language has been revised
27725	0				land-based CDR should have more focus, considering scenarios that limit warming to 1.5-2C all rely on these methods. Lack of thorough assessment of BECCS, in particular, throughout [Helene Muri, Norway]	addressed in new section B5
29229	0				As the SPM is written at this early stage it contains, in my view, too much general and descriptive information about what matters, linkages, what needs to be taken into consideration etc. I hope the SPM can develop into a summary with more clear and relevant statements and findings. [Jan Fuglestedt, Norway]	use of specific and quantified statements has been improved

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29235	0				The figures have the potentials to become very useful, and further development is needed. You may consider testing out how they are being understood by the users. Perhaps a process similar to the one we had for SR1.5 SPM figures could be used? [Jan Fuglestvedt, Norway]	noted
29285	0				I hope the SPM can give more and concrete information on a critical element in the SR1.5: The potential for negative emissions and the related side effects and various challenges. I hope the SPM can present perspectives and knowledge in a way that adds to the picture after SR1.5. [Jan Fuglestvedt, Norway]	noted
32375	0				<p>The current SPM assesses (future) response options while the main report also brings evidence/judgement on the merits of current practices that should likewise be reflected in the SPM. Here follows some input to such judgement (which should probably be differentiated according to various conditions; boreal/temperate/tropical, as well as under more water/land restricted or unrestricted situations):</p> <p>Deforestation is higher in tropical regions resulting from increased demand for food and commodities. This is also where (each unit) of land clearance contributes most to global warming (ch. 2.4, 2.5, 2.6). Moreover, these regions are also most affected by extreme heat and drought that can be enhanced in the absence of forests (2.6). Thus, afforestation and avoided deforestation are particularly promising while also difficult for tropical countries, suggesting particular incentives.</p> <p>For temperate regions, agricultural expansion has been extensive historically, which contributes strongly to current levels of GHG and temperatures. Agriculture in these regions plays a dominant role for the global supply of food - in the past, present and future. In recent decades, production increases in these regions have mostly been productivity increases per unit area. Thereby, agricultural expansion has been dampened, and existing lands are currently replaced by forests and settlements. While there are arguments for afforestation in these regions, overall effects for climate are mixed and depend on forest management and efficient use of harvested wood products. Afforestation in temperate zones may have co-benefits for hydrology, and should be designed accordingly.</p> <p>For boreal regions, forests are already expanding due to increased temperatures and CO₂-levels. For such expansion, warming effects of albedo dominates cooling effects of the enhanced land sink for CO₂, especially in areas with seasonal snow cover (ch. 2.6). Such feedback implies that further efforts are needed to limit global warming. Like for temperate forests, results for climate depend on forest management and efficient use of harvested wood products</p> <p>For soil organic carbon, approaches towards better conservation and performance of soils under various land management, arise as an arena of particular interest and potential.</p>	Noted - partly addressed in restructured section A

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5285	0				It is noted that the concept of browning as described in chapter 2 is neither addressed in the SPM nor in other chapters despite its quite fundamental impact. Quote from FAQ, chapter 2: Increased climate variability (extremes) and climate envelope shifts as a result of the warming climate are likely to result in a greening-to-browning reversal and overwhelm any benefits to land use and land cover derived from GHG emissions. Furthermore Chapter 7 touches upon the issue of crossing tipping points for specific ecosystems - which might happen even for GMT below 1.5 degrees C. Given the limited knowledge of tipping points of ecosystems there is the question to which extent land-based options can contribute to temperature stabilization in the case of over-shooting scenarios. [Klaus Radunsky, Austria]	Greening and browning have been included in revised SPM
6847	0				Overall the SPM does not sufficiently highlight the important trade-offs between many land-based climate change mitigation measures and food security objectives. These trade-offs in my view make measures such as afforestation, reforestation and bioenergy, implemented at large scale as proposed by many mitigation models, not feasible, desirable and contradictory to other sustainable development goals. These trade-offs are mentioned throughout the report, but not sufficiently highlighted in the SPM, so that policy makers will not correctly understand the message from this report. [Markus Giger, Switzerland]	accepted. Trade-offs have been given greater emphasis in revised SPM section C and Figure SPM 3
17769	0				One key critique is that it does not sufficiently reflect the range of possible future land-use patterns, including those compatible with high-mitigation pathways. This is first the case in section A on Impacts, which builds on the extremely useful findings of the SR1.5 by linking a certain degree of global warming to a level of impacts. However, it often uses a shortcut by linking these further to one land-use pattern, thereby failing to reflect the fact that there are many ways land and land use could look like for a same degree of global warming, and that these may either exacerbate or alleviate some of the impacts of global warming on land systems. In the SPM of this report, the diversity of possible future land use patterns should be acknowledged and better presented by clearly introducing the two dimensions of interest here, namely global warming and land-use pathways (to be linked with the broader SSPs), as well as what is known about their impacts (in the spirit of Fig. SPM3b). [Quentin Lejeune, Germany]	accepted - addressed by the inclusion on revised figure SPM 4
17771	0				Second, the diversity of possible futures for land use should be better reflected in the paragraphs on mitigation, especially those mentioning CDR in high-mitigation pathways. These very often focus on the challenges posed by land-based mitigation, which is understandable given their importance. However alternative pathways that do not rely as much on such technologies should also be mentioned in order to reduce the impression that we face a single choice between expansion of bioenergy and e.g. food security. The land-based mitigation solutions that partly circumvent this apparent contradiction are of equal importance to policymakers, and should therefore be better presented. This could be achieved by presenting a selection of a few very different "archetype" land-use pathways, building for example on the SSPs, and which could be characterised in terms of crop/forest/pasture extent, mitigation potential achieved by land measures (by distinguishing from dietary shifts etc.), as well as some quantitative or qualitative metrics related to their impacts on desertification, land degradation and food security. [Quentin Lejeune, Germany]	Noted - this section on CDR has been redrafted
22067	0				Overall - Please check: The significant contribution to SPM from Ch4 Land Degradation is limited in the present draft. Please address whether contribution can be increased. [Suvadip Neogi, India]	noted - section on land degradation has been redrafted section B 3

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
22173	0				Overall SPM-Please check: The immediate urgency/thrust is lacking for producing this report for land based mitigation and adaptation to climate change in light of limiting global warming within 1.5 deg C. [Suvadip Neogi, India]	Noted
22175	0				Please check: whole report- use of confidence language. [Suvadip Neogi, India]	use of confidence language has been revised
22177	0				Kindly check: Improvement in quantification-please mention degree/magnitude to express intensity/scale/severity-has to be specifically mentioned. [Suvadip Neogi, India]	noted - quantification has been addressed where justified by underlying chapter text
22179	0				Kindly check-There should be balance between sections A,B,C and D; A and B-too long; C and D-relatively shorter. [Suvadip Neogi, India]	noted - revised SPM has been comprehensively redrafted
22181	0				Please check: enabling conditions-context specific-needs elaboration with respect to developing and developed countries. [Suvadip Neogi, India]	noted - revised SPM has been comprehensively redrafted
22183	0				Please check: Elaboration needed with respect to tipping points in context of limits to adaptation capacities and residual risks. [Suvadip Neogi, India]	noted - revised SPM has been comprehensively redrafted
22185	0				Kindly check-economic dimension with regard to climate finance/cimate investment towards climate action for climate change mitigation and adaptation-in context of actions taken by developed and developing nations-needs elaboration. [Suvadip Neogi, India]	noted - revised SPM has been comprehensively redrafted
2049	0				My comments are only based in communication. Just to make the text more "readable" and ready to understand by policy makers and press. I have made a search in the text for "Virtually Certain", "Very high agreement" and "Robust evidence", with the intention that those sentences that have more certainty should be effectively highlighted in the SPM. At the same time, those with the lowest evidence should not be in the SPM. [Tomas Molina, Spain]	Noted
2055	0				There are 6 "Very high" and 22 Robust Evidence/high agreement, sentences in the SPM. The bold "resumée" of the beginning of each capital letter and single number (example A1, A2, A3...) should include certainly the content of those sentences. [Tomas Molina, Spain]	Noted
2059	0				List of the "Virtually Certain", "Very high agreement" and "Robust evidence" SPM [Tomas Molina, Spain]	Accepted
30193	1	1	1	1	Relevance and controversy of land-based mitigation. Add a section in SPM to reflect the controversy around CDR and its importance for ambitious climate targets, and also show ways forward (see also addition to other comments). [, Netherlands]	addressed in new section B5
30201	1	1	1	1	In general, a SPM should not be longer than about 20 pages. Sections C and D could be shortened because they contain a high share of vague, overlapping and rather trivial statements. Consider re-editing and shortening these sections. [, Netherlands]	noted

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
30217	1	1	1	1	There is a large discrepancy between the summary in B4 and the corresponding section on CDR in the Special Report on 1.5 degrees (section C3). Section B4 of the SPM SRCCL lacks quantification of the potentials that the SR1.5 does provide. It also has a much more negative tone on the use of CDR than in the SR 1.5 (maybe due to the lack of quantification of levels that can be applied sustainably). This will lead to confusion amongst policy makers. Please reconcile the text in B4 with section C3 of the SPM of SR1.5. In particular by referring to the conclusion in C3 that CDR deployment of several hundreds GtCO2 over the century (roughly equivalent to 4 GtCO2/yr on average) could be done without BECCS. And by referring to the statement in C3.2 of the SPM SR1.5 that BECCS potential (from bottom-up studies covered in chapter 4 of SR1.5) is upto 5 GtCO2/yr. And also by referring to the fact that the speed, scale and acceptability of CDR determines the ability to return temperatures to 1.5 degrees after an overshoot (C3.3 in SPM SR 1.5), as well as to the message from the SR1.5 that only limited overshoot of 0.2 degrees max can be managed. It is essential to come up with quantitative statements on CDR in the SRCCL that are consistent with SR1.5 and are both expressed in cumulative amounts of CDR and in GtCO2/yr. [, Netherlands]	addressed in part by new section B5
30409	1	1	1	1	In the summary deforestation as a major land use change problem is missing. This should be addressed taking into account regional drivers of deforestation (please contact Martin Herold for references: martin.herold@wur.nl). It is not totally clear whether deforestation is seen as an integral part of land degradation or not. One could assume this, however halting deforestation is not mentioned in figure SPM 1 under the challenge 4 Land Degradation. Under A4.1. changes in vegetation are mentioned in the general summing up of aspects of desertification, land degradation and food security. In Box SPM 1 under Box 1.2 deforestation is mentioned as a form of land use change. In the text under Figure SPM 3a 'vegetation changes' are mentioned as an aspect of land degradation. All in all I think the summary does not make a clear point about deforestation being a problem on a global scale that should be halted. It does not become clear that under the current NDCs deforestation in major tropical forest countries where large scale deforestation occurs might not halt even in 2030 (https://d5i6is0eze552.cloudfront.net/documents/Publikasjoner/Andre-rapporter/RF_Point_of_no_return_1218_web.pdf?mtime=20181203131631). However in Chapter B the point is made that large scale afforestation comes with the risk of conflicting with SDG's, but at this moment deforestation is a more direct threat to SDG's. [, Netherlands]	noted
30413	1	1	1	1	Agricultural land use and food systems are of key importance to humanity. However Box 1 it follows that agricultural land use only comprises 37% of the global terrestrial ice free land area. Therefore more attention should be paid to the 63% of the remaining land use like the 30% land area covered by forest (of which 9% untouched) and related deforestation. Please put some work in the remaining land: how is it going to be affected by climate change and what could be mitigation and adaptation options? [, Netherlands]	Box 1 has been removed and contents redrafted and integrated into section A
6151	1	2	1	2	Instead of "Fatima Denton (Gambia)", please write "Fatima Denton (The Gambia)" [Jacques-Andre Ndione, Senegal]	noted will be addressed in next version
8785	1	10	1	10	Please include 'change': It should read "... climate change mitigation ..." [Jean-Luc Chotte, France]	noted
12981	1	14	1	14	12% of ice free terrestrial area is cropland'. This seems too low? Does this include all four categories of cropland in figure SPM2 or is the meaning narrower here- needs to be clarified. [Aidan Farrell, Trinidad and Tobago]	Figure SPM 1 has been revised

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
22941	1	1	12	24	Section A general comment: consider re-organising the section Related to our general comment on making an effort to distinguish between climate change and other drivers of land-related impacts. In this regard, Section A of the SPM should be re-ordered. It currently mentions the context of climate change as one of several drivers in a number of different places. A more logical sequencing of the statements could be to explain how i) climate change combines with other (mainly anthropogenic) drivers to create a number of impacts; ii) how several of these drivers also affect the climate itself; iii) provide a high-level overview of expected socioeconomic and development impacts. This would then help frame the concepts of impacts and climate action that are further elaborated in Sections B, C & D (not least by explaining what, in a changing climate, is the difference between combatting degradation and adapting to climate change?). [Anastasios Kentarchos, Belgium]	partly accepted - new structure of Section A addresses many of these points
2119	1	1	30	39	The summary fails to significantly discuss the important policy implications of the various non-GHG pathways through which land use change affects climate, which are well-summarized in chapter two. [David Kaimowitz, Nicaragua]	restructured section A provides additional information on this drawn from chapter 2
24223	1	1	30	39	Even if agreed under the UNCCD system and in some of the IPCC definitions, that Deserts (Sahara), Tundra, Taiga, Arid Zones,... are part of the land systems and use (or SLM), it may be better in this special IPCC report to clearly differentiate and don't allow comparison and/or same consideration approaches between deserts/arid/... (warm) ecosystems and the cryosphere areas and systems, including permafrost thaw. For example, this is noted in paragraphs A 1.2, A 1.3, A 2.2., A4.1,...). And when the ice-free areas or glaciers,... are not taken into consideration and/or reflected under sections C. and D. of the SPM. [Kamal Djemouai, Algeria]	noted
24239	1	1	30	39	In the entire SPM, there is no mention on "Deserts ecosystems, Sahara, Oasis ecosystems, Traditional irrigation/water systems (Foggara,...)" that are all very important for such special IPCC report. And the literature exist on all those social and population related systems. [Kamal Djemouai, Algeria]	revised SPM includes more comprehensive headline statement on desertification - B2
29727	1	1	30	39	Overall, I want to congratulate the authors on the clarity of the text, and logical structure of the narrative - well done. [Mairi Dupar, United Kingdom (of Great Britain and Northern Ireland)]	noted
217	1	1	30	39	This document is supposed to be a summary for policy makers, but there is almost nothing on policy. On page 27, lines 19-25, there is a short paragraph that just speaks in generalities about policy, but with no specifics. If I were a policy maker reading this, I would feel that the authors totally missed the boat. There is no policy guidance in the document. There is not even an analysis of what the impacts of certain well-known policies might be. [Wallace Tyner, United States of America]	noted
219	1	1	30	39	In many places in the document, increasing biodiversity is touted as a panacea for reducing GHG emissions. Increasing biodiversity is good, but the scientific evidence that it will reduce GHG emissions is not what is claimed in this chapter. This appears to come from FAO dogma, and not from science. [Wallace Tyner, United States of America]	noted

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
11663	1	1	30	70	<p>In this short commentary. I focus my points on “summary for policy makers” section for its exceeding importance in communicating the findings of the report to policy makers and the public in general. In addition to my comments listed above.</p> <p>I find the section, in general, well written and flows easily especially when read under a non-expert lens, I salute the drafting authors efforts to combine and synthesise the information in a concise way. However, I think the summary misses on an important point, which is the connection between the Sustainable Development Goals (SDG) and the report’s recommendations. The point is brought up briefly on pages 21 & 30 but not directly in any of the figures especially SPM 1, which would be ideal for this type of connection and will likely be utilized intensively by variable sectors e.g. professors, policy maker to convey certain points. This particular point is likely to gain robust attention in light of the results from COP-24 and the Paris Agreement rulebook.</p> <p>Further, I think an increased effort should be on tangible languages for alternative solutions. A good examples on such language is from page 25, lines 26-28 and I quote “By providing a dynamic process-based approach to natural resource management that is inclusive of stakeholders in defining both objectives and implementation strategies, adaptive management can better respond to uncertainty and cascading risks.{Figure SPM8, 7.7.3}.”</p> <p>Lastly, there is a greater emphasize through the report on the effect of diet on reducing GHG which related to the scope of the report, however, I was unable to find one sentence or reference that relates the effect of the fashion industry on the reduction of GHG emissions and meeting the goals of the Paris Agreement although that utilizes a large sector of the landscape for agricultural uses. Thank you. [Linah Ababneh, Sweden]</p>	Noted
33803	1		30		<p>General comment to the SPM: statement/findings are well developed, and it would be useful to see a larger degree of policy relevance directly linked to them. "This" is the finding, and "this" is the corresponding policy options. Ideally, for ease of reading and understanding, the sentence could start with the policy options, followed by the finding justifying the options - where relevant. [, Norway]</p>	partially accepted - addressed in part by the revised structure in the second draft SPM
33805	1		30		<p>General comment to the SPM: Several of the chapters on the main report mentions land conservation / protection, but there's little mention of this in the SPM (with the exception of line 13 in section B3.2 on page 18). Conservation / protection of high carbon stock areas (such as forest, grassland / savannah and peatlands) should be separate options mentioned where relevant. It's an important response option of high relevance to policy makers. For example: in figure SPM 4, almost all examples under land management are examples linked to forestry, which is the use and exploitation of forests. Including forest protection in this table is highly relevant. There is strong recognition of the need to protect and conserve forests today in a climate context and several large-scale initiatives/mechanisms in progress, and so this could be included as a separate forest management option. [, Norway]</p>	Noted

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
33807	1		30		General comment to the SPM: there is very little mention of the link between climate, ecosystem services and the importance of biodiversity in a climate change mitigation/adaptation context. The link between climate change and biodiversity will become increasingly clear in the next few years, and this SPM should be forward looking in this regard so as not to provide soon-to-be outdated policy advice. UNEP is launching GEO6 in March 2019, which basically questions the viability of ecosystems if the current trend of destruction of biodiversity continues. This report would benefit from including this aspect and reflecting it in its policy advice to a larger degree. Several of the sections in part A) and B) include reference to response options which are potentially harmful to biodiversity, with only superficial mention of this. Part C) and D) contains ecosystem-based approach and advice to climate change mitigation and adaptation, and also includes assessments of risks. Even so, the SPM could benefit from a more balanced picture throughout. [, Norway]	noted - the SPM has been redrafted to give appropriate weight to a range of issues
1291	1		30		In my opinion overall the Summary for Policymakers is clearly written [Pushp Raj Tiwari, United Kingdom (of Great Britain and Northern Ireland)]	thanks
22943	1	1			SPM general comment: insufficient attention to GHG fluxes Apart from Box 1, the important issue of GHG fluxes (i.e. net emissions related to land sector) is largely neglected. This needs to be rectified. This material is highly policy relevant (despite its complexity). In particular, the SPM already pays quite a lot of attention to mitigation, including the argument that near-term opportunities should be exploited in order to reduce reliance on large-scale land-based mitigation later on. Surely a more thorough treatment of the sector's net emissions in the first place is necessary to underpin this. This material is largely covered in Chapter 2 (esp 2.4 & 2.7). Recommendation - the Ch2 authors should make an effort to synthesise the main policy-relevant arguments from the ample, complex material provided on fluxes in the Chapter 2. This synthesised information can then be brought into the SPM. [Anastasios Kentarchos, Belgium]	Accepted - Addressed in new section A4
22945	1	1			General Comment: more joined-up approach between figures and text in the SPM. Most of the figures in the SPM are very informative and make arguments that are lacking in the text itself. Often the text is extremely general and lacking in tangible examples to support the assertions made. Meanwhile, the figures are full of such examples. The report would therefore be greatly improved if the text were to refer explicitly to some of the key findings highlighted in the figures. In particular, regarding Figures SPM2, Table SPM-1 (on p15 & 16) and SPM5. The most important features or selected highlights from these figures could be explained in the relevant text of the SPM, thereby improving text which is otherwise very general. [Anastasios Kentarchos, Belgium]	All figures have been revised

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
22947	1	1			<p>General SPM comment [*joint SROCC/SRCCL comment*] - consider a joined-up approach between SROCC & SRCCL on general mitigation & adaptation advice (Section C of SROCC SPM, Sections C & D of SRCCL SPM)</p> <p>* Sections C & D of the SRCCL SPM and Section C of SROCC SPM contain a lot of advice on mitigation and adaptation that is not specific to the scope of the individual reports. Issues discussed in both SPMs include: the need to take short-term decisions in the context of uncertainty; the need for ecosystem-based and community-based approaches; the challenges of short-term investment for long-term payback; the importance of indigenous & local knowledge; the need for stakeholder ownership/involvement & challenges of multi-layer governance; hidden barriers to measures that are theoretically low cost; the benefits of monitoring, early warning and a hazard-based approach.</p> <p>* Recommendation: explore the possibility of dealing with above general issues in a consistent manner across the SROCC & SRCCL teams. Ideally this would: help policymakers by avoiding separate 'competing' messages; save duplication of work within the author/ editor teams; allow SRCCL and SROCC to concentrate on the aspects of mitigation and adaptation action specific to the scope of their reports - drawing on common material for the more generic messages. [Anastasios Kentarchos, Belgium]</p>	noted
33809	2	1	2	14	<p>More about the context and delimitation of the report should be included in the introduction, including reference to the SROCC. E.g. mention the 4 important factors in the climate system; atmosphere, Ocean, Cryosphere and land and explain that two of these are covered in SROCC and land is covered in this report (SRCCL) [, Norway]</p>	Thank you for your comment. Your suggestion has been partially accepted. The final draft introduction mentions about the AR6 reports, which implicitly include the SROCC.
28289	2	2	2	5	<p>General: This comment is about the SPM and Chapter 6. Chapter 6 of this report -- and thus the SPM -- is intended to integrated the 6 themes identified in the title: 'climate change and land' addresses the 6 aspects 'climate change', 'desertification', 'land degradation', 'sustianable land management', 'food security' and 'GHG fluxes'. It is important that this special report shows that it provides an integrated analysis of thes 6 aspects. While integration is the intent, we feel that these themes are being handled individually, with some discussion about integration secondary. The final draft of the SPM should reflect the reverse of this. Policy makers already have a lot of knowledge about these individual themes, and there are a number of existitng policy decisions that can be built upon. However, their integration still presents and enormous challenge, one which policy makers are looking for guidance to address. The most common form of feedback they receive from governments, CSOs and practitioners is about synergies and achieving multiple benefits. The "integration" aspect of this report is critical and needs to lead rather than follow the primary findings. [Barron Joseph Orr, Germany]</p>	Thank you for your comment. Accepted suggestion. The Sections B, C and D of the SPM include integrated responses to address land-related challenges discussed in detail in the report chapters.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
8783	2	2	2	5	The Title of this special report on 'climate change and land' addresses the 6 aspects 'climate change', 'desertification', 'land degradation', 'sustainable land management', 'food security' and 'GHG fluxes'. It is important that this special report shows that it provides an integrated analysis of these 6 aspects. This integrated approach should ensure that this report provides added value to the broad/diverse stakeholder community waiting for the outcomes of this report. This special report on 'climate change and land' will benefit from the fact of highlighting this integrated approach in its introductory section, thereby also emphasizing that the aspects 'climate change' and 'sustainable land management' have an overarching nature across all chapters of the report and across all sections of the SPM. [Jean-Luc Chotte, France]	Thank you for your comment. Accepted suggestion. The Sections B, C and D of the SPM include integrated responses to address land-related challenges discussed in detail in the report chapters. Please see the SPM figure with adaptation and mitigation responses.
3859	2	3	2	3	Footnote 1 has to be deleted because the information provided confuses the reader: are the mentioned proposals taken into account in the current report, or is this report diverging from these proposals and not addressing (good) ideas contained in these proposals? [, Switzerland]	Thank you for your comment. Accepted. The footnote 1 has been revised as following: "1FOOTNOTE: Related proposals were: Climate Change and Desertification; Desertification with Regional Aspects; Land Degradation – An Assessment of the Inter-linkages and Integrated Strategies for Mitigation and Adaptation; Agriculture, Forestry and Other Land Use; Climate Change, Food and Agriculture; and Food Security and Climate Change."
22033	2	3	2	3	Climate adaptation' or 'adaptation to climate change' or 'adaptation in changing climate'.....please check [Suvadip Neogi, India]	Thank you for your comment. Accepted and revised. The final version apply consistent terminologies across the entire SPM.
2963	2	3	2	5	Proposed change: It assesses climate-related issues of sustainable land management, adaptation and mitigation responses to the challenges of desertification, land degradation and food security, in the context of sustainable development and limiting of anthropogenic impacts on the global climate. [, Russian Federation]	Thank you for your comment. Partially accepted. The introduction narrative follows the SRCCL scoping report.
38189	2	3	2	5	This text modifies the framing of the SRCCL from what was adopted at IPCC P-45. The focus of the report is intended to be "Climate Change and Land: An IPCC Special Report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems." It is supposed to be about these specific topics, not about "climate mitigation and adaptation responses to the challenges of desertification, land degradation, and food security." The agreed mandate also does not include a qualifier about "in the context of sustainable development." The SPM and the overall report should be revised to refocus on the mandate. [, United States of America]	Thank you for your comment. Partially accepted. The SPM and the entire report FGD follows the Report scoping meeting, which addresses the IPCC P-45 mandate. The context of "Sustainable development" is address in the response options sections.
3861	2	4	2	5	Write: "... in the context of climate change and sustainable development." [, Switzerland]	Thank you for your comment. Rejected. The introduction has been revised and restructured. Sustainable land management is mentioned in line with the Report scoping meeting narrative.
30695	2	5	2	6	It is not clear, when we write - this report sits alongside other IPCC special report and other reports from UN BODIES . This does not provide a clarity on what is intended. We suggest the sentence to be deleted . [, United Republic of Tanzania]	Thank you for your comment. Partially accepted. A footnote has been added to specify which reports are mentioned: "2FOOTNOTE: Related reports from other UN Bodies include the thematic assessment of the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) on Land Degradation and Restoration and the Global Land Outlook of the UN Convention to Combat Desertification (UNCCD)."

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
32993	2	6	2	6	2 Footnote: Related reports from other UN Bodies include the thematic assessment of the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) on Land Degradation and Restoration, the Global Land Outlook of the UN Convention to Combat Desertification (UNCCD) and the Global Biodiversity Outlook of the Convention on Biological Diversity (CBD). [Christopher Pereira, Canada]	Thank you for your comment. The footnote has been revised and your suggestion partially accepted.
3863	2	6	2	6	The reference to other reports is challenging because the nature of the referred reports is not the same: the one of the IPBES is an "assessment" report elaborated and adopted according the same rules than those of the IPCC, instead the one of the UNCCD is not an "assessment" report according to the IPCC standard and has followed another trajectory for its elaboration and adoption. By the way, in the Footnote 2 has to be improved: mention the year of the adoption of the mentioned reports; name correctly IPBES (Intergovernmental Science-Policy Platform ...; etc. [, Switzerland]	Thank you for your comment. Accepted. Footnote 2 has been revised as following: "2FOOTNOTE: Related reports from other UN Bodies include the thematic assessment of the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) on Land Degradation and Restoration and the Global Land Outlook of the UN Convention to Combat Desertification (UNCCD)."
30697	2	6	2	8	We think that all reviewed literatures are carefully and adequately scrutinized and assessed to ensure coherence and comprehensive reflection of the current state of knowledge and therefore we do not think it is appropriate to mention it here, that certain documents were carefully assessed. [, United Republic of Tanzania]	Thank you for your comment. Partially accepted. To guarantee a transparent and objective assessment, Footnote 3 specify the cut date of assessed literature: "3FOOTNOTE: The assessment covers literature accepted for publication by 7th April 2019."
30015	2	8	2	8	Footnote 3 refers to 7 april 2019. This should be 2018? [, Netherlands]	Thank you for your comment. It is meant to be April 2019.
23583	2	9	2	10	The interaction between land and atmosphere in climate change, as it is a summary, suggests directly giving an explanation of what the interaction between the two is. [Huai Jianjun, China]	Thank you for your comment. Partially accepted.
32235	2		2		In the Footnote 2 also consider "The Assessment Report on Pollinators, Pollination and Food Production" by IPBES [Carmela Cascone, Italy]	Thank you for your comment. The footnote has been revised and your suggestion partially accepted.
8815	2	1	3	27	Mentioning of Figure SPM1 is missing. [Jean-Luc Chotte, France]	Thank you for your comment. In the final draft, all figures have been revised and cited.
28285	2	1	30	39	General: The Scientific Conceptual Framework for Land Degradation Neutrality, which was endorsed by all 197 Parties in 2017, includes a "Response Hierarchy" of avoid > reduce > reverse land degradation. This hierarchy was adopted into the SPM for the IPBES LDRA and we would encourage the same for the IPCC SRCCL. This would provide a common response hierarchy, and thus a harmonization of approaches, allowing policy makers to more readily transform key messages from the IPBES LDRA and IPCC SRCCL into policy. Put another way, where these reports reach common conclusions, the fact that they reinforce each other is extremely important to policy makers. And language -- word choice -- is the mechanism which makes this more possible by policy makers. [Barron Joseph Orr, Germany]	Thank you for your comment and suggestion. The final draft SPM takes into consideration the Scientific Framework for Land Degradation Neutrality. Responses are presented in Section B of the SPM and follow this approach.
28287	2	1	30	39	General: Building off of the last comment, the SPM is not consistent in the use of terms. For example, in some places "avoid" is used, and in others "prevent". The "avoid > reduce > reverse" continuum would allow the authors to use generic terms that are not easily confused with specific remedies or response measures -- whereas terms like "prevent" and "mitigate" are labels for a number of specific measures. It is highly recommended that this kind of confusion be avoided as it creates unnecessary debate, pulling policy makers away from the core issues that need to be addressed coming out of findings of major assessments such as this. [Barron Joseph Orr, Germany]	Thank you for your comment. The consistency of terms has been revised in the final draft of the SPM, as explained in the previous response.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
28291	2	1	30	39	General: The glossary and some of the chapters are careful to distinguish restoration and rehabilitation as two means towards reversing land degradation...but for some reason, the SPM does not do this (rehabilitation is not mentioned). It is very important to include both whenever reversing land degradation is discussed. [Barron Joseph Orr, Germany]	Thank you for your comment. Land rehabilitation is mentioned in the Sections B and C of the SPM final draft.
28293	2	1	30	39	It is not clear why in some instances the term "degradation" is used, in others "desertification" and in many others both. Clear definitions for these two terms are needed in the SPM and it needs to be checked which is being referred to in any one point. Given that desertification is defined as land degradation in drylands (chapter 3) in essence if this is substitute for desertification then many sentences could be read as "Land degradation and land degradation in drylands is". This is clearly repetitive and redundant. An alternative would be to only use the term "land degradation" throughout the SPM, and then specify within the text of the point if it has a specific dryland importance (or non-dryland importance). Again a box giving the definitions of both terms and how they are to be interpreted is important. and it needs to be checked which is being referred to in any one point. Given that desertification is defined as land degradation in drylands (chapter 3) in essence many sentences could be read as "land degradation or land degradation in drylands". An alternative would be to only use the term "land degradation" throughout the SPM, and then specify within the text of the point if it has a specific dryland importance. Again a box giving the definitions of both terms and how they are to be interpreted is important. [Barron Joseph Orr, Germany]	Thank you for your comment. This comment has partially accepted. Definitions and terminology applied in this report are compiled in the Glossary document. The SPM follows this nomenclature. Due to page limited it is not possible to include a box of definition in the SPM.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
8747	2	1	30	39	The UNCCD SPI reviewers welcomed the progress made on SOD SPM and the way many of the points raised in the FOD were addressed. The UNCCD SPI reviewers acknowledge and appreciate the consideration of related reports from other UN Bodies. This should ensure coherence and complementarity of this report and avoidance of redundancies. In the SOD, some concerns remain as an effort to consolidate definition, terminology to use updated and well accepted definitions throughout the document. Particularly The UNCCD SPI reviewers would like to stress out the following points: i) Consider defining terminology used for spatial scales (local, regional) and revise the text accordingly (explanation given in the same comment for Chapter 2), ii) Consider using terminology “extreme climate conditions” and “extreme weather events” instead of “extreme climate events” and change in the text accordingly. When using only “extreme events”, specify “extreme weather events” (explanation given in the same comment for Chapter 2), iii) Degradation and Desertification are not synonymous, as a matter of fact It is not clear why in some instances the term "degradation" is used, in others "desertification" and in many others both. Clear definitions for these two terms are needed in the SPM and it needs to be checked which is being referred to in any one point. Given that desertification is defined as land degradation in drylands (chapter 3) in essence if this is substitute for desertification then many sentences could be read as "Land degradation and land degradation in drylands is". This is clearly repetitive and redundant. An alternative would be to only use the term "land degradation" throughout the SPM, and then specify within the text of the point if it has a specific dryland importance (or non-dryland importance). A box giving the definitions of both terms and how they are to be interpreted is important. and it needs to be checked which is being referred to in any one point. Given that desertification is defined as land degradation in drylands (chapter 3) in essence many sentences could be read as "land degradation or land degradation in drylands". An alternative would be to only use the term "land degradation" throughout the SPM, and then specify within the text of the point if it has a specific dryland importance. A box giving the definitions of both terms and how they are to be interpreted is important. iv)Terms "avoid" and "prevent"; Both terms 'avoid' and 'prevent' are being used in this document. The use of the term avoid ensures consistency between the reports of different UN bodies (e.g. IPBES assessment of land degradation and restoration, and the UNCCD scientific Conceptual Framework for Land Degradation Neutrality). Question: Are the terms 'prevent' and 'avoid' being used interchangeably. If so, then it would be useful to ensure consistency in the use of terminology throughout the SPM. If this is not the case, then it would be helpful to provide a definition for both terms. The UNCCD SPI reviewers	Thank you for your comprehensive comment. The terminologies used in the SRCCL were revised in the FGD. All definitions are compiled in the report glossary and consistent with other IPCC/UN reports.
8777	2	1	30	39	General: Please ensure that land restoration and land rehabilitation need to be mentioned, when discussing measures to reverse land degradation and desertification. Currently, usually land restoration is mentioned. This is unbalanced. The reason for this is provided in the glossary, where a clear distinction is made between land rehabilitaton and land restoration. [Jean-Luc Chotte, France]	Thank you for your comment. The introduction has been shorten in the final version. Detailed assessment of land restoration and rehabilitation is provided in chapters 3 and 4 and the section B of the SPM.
8779	2	1	30	39	General: Both terms 'avoid' and 'prevent' are being used in this document. The use of the term avoid ensures consistency between the reports of differenty UN bodies (e.g. IPBES assessment of land degradation and restoration, and the UNCCD scientific Conceptual Framework for Land Degradation Neutrality). Question: Are the terms 'prevent' and 'avoid' being used interchangeably If so, then it would be useful to ensure consistency in the use of terminology throughout the SPM. If this is not the case, then it would be helpful to provide a definition for both terms. [Jean-Luc Chotte, France]	Thank you for your comment. The final draft has been updated and consistency has been revised carefully.
8781	2	1	30	39	General: We acknowledge and appreciate the consideration of related reports from other UN Bodies. This should ensure coherence and complementarity of this report and avoidance of redundancies. [Jean-Luc Chotte, France]	Thank you for your comment. Noted and taking into account in the final draft.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
8817	2	1	30	39	GENERAL: Consider defining terminology used for spatial scales (local, regional) and revise the text accordingly (explanation given in the same comment for Chapter 2). [Jean-Luc Chotte, France]	Thank you for your comment. Noted and taking into account in the final draft of chapter 2.
8819	2	1	30	39	GENERAL: Consider using terminology "extreme climate conditions" and "extreme weather events" instead of "extreme climate events" and change in the text accordingly. When using only "extreme events" specify ""extreme weather events" (explanation given in the same comment for Chapter 2). [Jean-Luc Chotte, France]	Thank you for your comment. Noted and taking into account in the final draft of chapter 2.
8827	2	1	30	39	General comment in SPM: Its important to preserve the LDN language a long the SPM document. [Jean-Luc Chotte, France]	Thank you for your comment. The definition of LDN has been included in the gloassry and mentioned in the SPM final draft (see sections B and C).
8829	2	1	30	39	General: It is not clear why in some instances the term "degradation" is used, in others "desertification" and in many others both. Clear definitions for these two terms are needed in the SPM and it needs to be checked which is being referred to in any one point. Given that desertification is defined as land degradation in drylands (chapter 3) in essence if this is substitute for desertification then many sentences could be read as "Land degradation and land degradation in drylands is". This is clearly repetitive and redundant. An alternative would be to only use the term "land degradation" throughout the SPM, and then specify within the text of the point if it has a specific dryland importance (or non-dryland importance). Again a box giving the definitions of both terms and how they are to be interpreted is important. and it needs to be checked which is being referred to in any one point. Given that desertification is defined as land degradation in drylands (chapter 3) in essence many sentences could be read as "land degradation or land degradation in drylands". An alternative would be to only use the term "land degradation" throughout the SPM, and then specify within the text of the point if it has a specific dryland importance. Again a box giving the definitions of both terms and how they are to be interpreted is important. [Jean-Luc Chotte, France]	Thank you for your comment. Clear definitions of both land degradation and desertification are provided in the glossary. Those are in accordance to the UN reports and previous IPCC reports.
8831	2	1	30	39	It is not clear why in some instances the term "degradation" is used, in others "desertification" and in many others both. Clear definitions for these two terms are needed in the SPM and it needs to be checked which is being referred to in any one point. Given that desertification is defined as land degradation in drylands (chapter 3) in essence if this is substitute for desertification then many sentences could be read as "Land degradation and land degradation in drylands is". This is clearly repetitive and redundant. An alternative would be to only use the term "land degradation" throughout the SPM, and then specify within the text of the point if it has a specific dryland importance (or non-dryland importance). Again a box giving the definitions of both terms and how they are to be interpreted is important. and it needs to be checked which is being referred to in any one point. Given that desertification is defined as land degradation in drylands (chapter 3) in essence many sentences could be read as "land degradation or land degradation in drylands". An alternative would be to only use the term "land degradation" throughout the SPM, and then specify within the text of the point if it has a specific dryland importance. Again a box giving the definitions of both terms and how they are to be interpreted is important. [Jean-Luc Chotte, France]	Thank you for your comment. Clear definitions of both land degradation and desertification are provided in the glossary. Those are in accordance to the UN reports and previous IPCC reports.
27527	2	2			This report does not respond to the various proposals but to the decision of the 45th IPCC Plenary. Please correct. [, Germany]	Thank you for your comment. The SPM final version has been revised to consider all the elements of the SRCCL Scoping report.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
15761	2				SPM A2 and B1: It is suggested that the health and infrastructure of the coastal areas should be added to the report. [, Iran]	Thank you for your comment and suggestion. Partially accepted. The vulnerability of coastal areas is addressed in A2 as follows: "Vulnerability to land degradation is particularly high in low-lying coastal areas, river deltas, and in permafrost areas"
27535	3	23	2	27	Please mention that the scale of NET is varying in these pathways and depends on the political choices - preferably in the specific section on CDR we are suggesting. [, Germany]	This topic is no longer covered in A1. Text has been deleted
25843	3	1	3	1	Section A does not provide any finding on the possible impacts of climate change on the future GHGs fluxes between the land and the atmosphere. Though the information is not very rich on this issue in the report itself, we suggest to add in A3 or in Box SPM1 at least one short summary of 2.4.1.3. This could be reduced to "It is uncertain whether warmer climates will lead to a greater or lesser storage of carbon on land." [, France]	Agreed. A1 now includes a subsection on GHG fluxes
26021	3	1	3	1	The SPM lacks a short summary of the impact of climate change on the GHGs fluxes between the land and the atmosphere, even if the related information developed in Chapter 2 is rather limited. [, France]	Agreed. A1 now includes a subsection on GHG fluxes
30339	3	1	3	1	Consider adjusting the title of section A, because the content is much broader than land and atmospheric interactions, which suggests a mere physical or chemical interaction. Section A is about socio-economic interaction as well [, Netherlands]	Agreed. The title has been modified to include 'people'
20637	3	1	3	1	The significant role of peatlands should be quantified and feature more prominently across the report, and this should be reflected in the Executive Summary of Chapter 2 in particular, and most definitely in the SPM: Northern Hemisphere peatlands take up 3% of land area but store 30% of the global soil carbon pool (Blodau, C., 2002. Carbon cycling in peatlands: A review of processes and controls. Environmental Reviews, 10(2), pp.111-134.). Maintaining peatlands is vital, and this IPCC report will underpin policies to promote the protection of these environments. [, United Kingdom (of Great Britain and Northern Ireland)]	The role of peatlands is beyond the scope of key message A1
20639	3	1	3	1	We would welcome more substance in the SPM on agroforestry options and limitations, especially in terms of noting variance in the amount of carbon that can be sequestered based on different agroforestry styles, tree species and soil types. [, United Kingdom (of Great Britain and Northern Ireland)]	A specific analysis of agroforestry is beyond the scope of A1
30329	3	1	3	27	One has to read the whole paragraph first to be able to make an interpretation of what is being stated in A1. In A1 it would be more clear to state 'Human well-being is inextricably linked to land use and climate change' or 'Land use and climate change are inextricably linked to human well-being' or 'Anthropogenic decisions in land use influence climate change and have a huge impact on human well-being'. Whether climate change is human-induced or not does not matter in the influence it has on human well-being, so the adverb anthropogenic to climate change does not make sense here. There are too many messages in one sentence. [, Netherlands]	Agreed the section has been re-written to focus specifically on the role of the land system for humanity
16397	3	1	3	27	There is no definition or description about Figure SPM 1 in A1. Definition at least why they are extracted from 1 to 5 should be needed. [, Republic of Korea]	Agreed and referencing has now been added

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
15159	3	1	3	27	Is it possible that the opening section of the SPM in fact takes too narrow a focus, and what is missing is an upfront section on the interaction between land and the total biosphere: whereby land management actions and impacts may trigger multiple tipping points across multiple planetary boundaries, which in turn may bring on even more rapid global climate change? This additional upfront section could be used to introduce both a more urgent, and more holistic and up-to-date, framing of the land/climate focus of this special report. As it is, the SPM overall reads as somewhat reductive: listing a great number of land-climate interactions. What would be really valuable to convey however is a single diagram showing the immense urgency of the IPCC 1.5 degree report's finding that, eg, land management impacts on biodiversity that puts the entire long-term viability of the biosphere at risk, which in turn threatens the climate resilience of forests and ecosystems, and thereby their role as carbon reservoirs and sinks, as well as agricultural systems. ie, can we include a more compelling upfront illustration that shows the critical link between land management, the biosphere's safe operating environment, the climate - and thereby the future continuation of agriculture and even human civilisation, as we know it? [Maya Hunt, New Zealand]	Agreed. The text has been revised to emphasise the importance of land resources including biodiversity and ecosystem services for humanity
22035	3	3	3	3	A1-Please check: 'land use' or 'land use practices' [Suvadip Neogi, India]	Done
7231	3	3	3	6	Please add your assessment of the headline statement [Debra Roberts, South Africa]	Confidence language has been added
24383	3	3	3	6	There is no need to specify "anthropogenic" here, it is redundant and confusing. [, Belgium]	Done
24385	3	3	3	6	This would be clearer without the negations: "Land management decisions affect the livelihoods of billions of people and they are projected to..." [, Belgium]	Done
24475	3	3	3	6	Consider another opening statement, perhaps linked to text in UNFCCC or Paris Agreement on protecting food production systems or the protection of carbon stocks and sinks [, Ireland]	The opening statement of A1 has been re-written
24477	3	3	3	6	Another option for an opening statement would be a statement on the totality of land cover and the % that is considered to be a stock for carbon and an active part of the land atmosphere exchange process for GHGs, and then the % that is considered to be managed, and the % managed for food production [, Ireland]	The opening statement of A1 has been re-written
24479	3	3	3	6	Use "mitigating climate change" rather than "responding to climate change", as this is core to the statement in A1.4 [, Ireland]	The text has been changed
775	3	3	3	6	this paragraph does not include any confidence level. Either it is added or the paragraph should be deleted. [, Spain]	Confidence levels have been added
17517	3	3	3	6	It would be good to include here that land management is also a driver of climate change (e.g. deforestation). Likewise, "responding to" could be reformulated to more directly point at mitigation. (Mitigation and adaptation are both responses.) [, Sweden]	Agreed. Land management and especially it intensification has been added to the text and SPM Fig 1
17775	3	3	3	6	The statement "Land management decisions [...] are projected to play an increasingly important role in [...] adapting to climate change" is not supported by any statement in the sub-paragraphs. This feels strange given the importance of land systems in the portfolio of adaptation options, as illustrated in Table SPM1. Adding a sub-paragraph to illustrate this even better at this stage of the SPM would be very beneficial. [Quentin Lejeune, Germany]	Climate change adaptation is no longer addressed by this section. Land management and intensification is however covered both here and in SPM Fig1

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1551	3	3	3	11	This development is critical for countries affected, such as Bangladesh, as agricultural (rice field) workers are fleeing flooding there, and migrating via Tripoli & Italy into Nottingham, here in the UK. While there is a local Bangladesh community here in Nottingham to support such migrants, many remain unskilled and unemployed in the UK. As such, this development has policy implications for all governments managing citizens affected along this arguably long migrant journey chain. [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	Section A1 no longer treats the migration issue
30379	3	3	3	11	A1.1 at least forestry should be mentioned next to agriculture. The forest sector is economically substantial. Especially for northern countries like Canada, Sweden, Finland, Russia and several other European, African, Asian, and American countries, being sustainable or not. This land sector can not be left out as an economic sector next to agriculture. [Netherlands]	Forestry is now mentioned and is also included in SPM Fig1
30435	3	3	3	27	A clear and scientifically robust statement of the anthropogenic cause of climate change would be an effective and necessary start to the report, but this section of the Summary for Policymakers is silent on this key point of science fundamental to the entire report. This statement would go in Section A1, preferably as the first paragraph. [Gonzalez Patrick, United States of America]	Section A1 is now introducing the concept of the importance of land for humanity (with justification). This is setting the scene before the SPM continues with the added pressures arising from climate change
6327	3	3	3	27	A key element that is missing from section A1 is the impact of climate change, land degradation and desertification on sustainable development. It is not just the response options themselves that can compromise sustainable development, but also the lack of action and the ongoing impacts of climate change. [Gambia]	Section A1 no longer addresses climate change impacts, which is now treated in other parts of the SPM
30699	3	3	3	27	A key element that is missing from section A1 is the impact of climate change, land degradation and desertification on sustainable development. It is not just the response options themselves that can compromise sustainable development, but also the lack of action and the ongoing impacts of climate change. [United Republic of Tanzania]	See response to this comments above (repeated)
3865	3	4	3	4	Write: "Current land use and land management decisions not only ..." in order to better reflect the content of section A.1. [Switzerland]	Section A1 has been re-written
15165	3	4	3	5	Land management decisions roles include "driving" as well as responding to and adapting to climate change [Daniel Zarin, United States of America]	Agreed, the text has been changed appropriately
29871	3	4	3	6	responding to' - it is not clear what is meant by this. Adaptation is also a response to climate change. Probably it should be 'mitigation of'. Please correct. [Estonia]	Agreed. The text has been revised accordingly
15527	3	5	3	5	Remove second "to" of the line, as it is redundant. It should read: "responding and adapting to climate change". [Annika Herbert, South Africa]	Text has been re-written
15289	3	5	3	5	'Suggest rewording the statement to be 'important role in responding to and adapting to climate change' - as adaptation to climate change is a response to climate change. If 'response' here means 'mitigation', suggest make this clear. [Australia]	Climate change adaptation is now no longer covered in this section. Text has been re-written
24387	3	5	3	5	"adaptation" is not needed here because it is already included in "responses". [Belgium]	Agreed and re-written
25845	3	5	3	5	The word "mitigation" should also be highlighted, in link with § A1.4. [France]	Mitigation is now not treated in A1
4833	3	5	3	5	The phrase "Responding to" would need to be revised to "mitigating", because "Responding" is a term that includes "adapting", and maintaining the word "Responding" overlaps with the following word "adapting". [Japan]	Agreed. Text changed
6039	3	5	3	5	Delete "in responding to" and replace with "in mitigating and".. [Poland]	Agreed. Text changed
2965	3	5	3	5	adapting' is a part of 'responding'; the former one is redundant [Russian Federation]	Agreed. Text changed

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38191	3	6	3	6	Point of style, top line statements should include references to the underlying chapters with only one decimal place. Change {1.2.1, 1.2.2, 1.3.2,...} to {1.2, 1.3, ...}. [United States of America]	References have been added according to standard IPCC procedures
30331	3	7	3	7	Please relate 3 billion to the world poluplation (so: about half of the world population). [Netherlands]	We assume that the reader knows the world population. Tis text has now been moved to A2
30415	3	7	3	7	Use 'around 2010' in stead of starting the paragraph with 'by the end of the first decade of the 21st century'. [Netherlands]	Text has been edited accordingly
33811	3	7	3	7	Please set the 3 bilion people into context also by pointing out that this is about 40 % of the world's population of 7,6 billion people. [Norway]	We assume that the reader knows the world population. This text has now been moved to A2
20643	3	7	3	7	The phrase 'By the end of the first decade of the 21st century...' is unnecessarily complex, and could be replaced by 'By 2010...' [United Kingdom (of Great Britain and Northern Ireland)]	Text has been edited accordingly
14529	3	7	3	8	The text states that 3 billion people derived their employment from agriculture related activities in the first decade of the 21st century (the text states income and employment, so the figure presumably doesn't include dependents). World Bank figures (https://data.worldbank.org/indicator/SL.TLF.TOTL.IN) indicate that the global workforce in 2005 was 3 billion. Therefore this implies that the entire global workforce worked in agriculture related activities in the first decade of the 21st century. The definition of 'agriculture related' used here must be so broad as to encompass everything. Suggest either deleting or quoting the number of people directly employed in agriculture. [Canada]	The figures have been verified and moved to section A2
25847	3	7	3	8	Is it possible to add a mean of the given percentage ? [France]	The figures have been updated and checked across the section
29873	3	7	3	9	Why agicultural systems and economies relying on agriculture are more vulnerable than other sectors? Add a short explanation please. [Estonia]	This point has been removed
7229	3	7	3	11	An assessment of this bullet point is required. [Debra Roberts, South Africa]	Confidence language has been added
24473	3	7	3	11	The IPCC has avoided using GDP. Perhaps a more standard economic indicator could be used instead [Ireland]	Reject. In this case GDP refers to a specific literature source.
24481	3	7	3	11	The opening phrase could be shortened to "currently"; also should mention that this feeds a global population of 7.2 billion and how this is projected to change by 2050 [Ireland]	The text has been completely revised
33813	3	7	3	11	Agriculture is not only sources of income and employment, when looking at the original formulation from 7.4.1 food itself are also included in the sentence. Please consider to include food. Please also consider describing both current and future expected population dynamics and link this to agricultural needs. [Norway]	This point is no longer considered in A1, but in A2, with an increased focus on 'food'
779	3	7	3	11	this paragraph does not include any confidence level. Either it is added or the paragraph should be deleted. [Spain]	Confidence language has been added
3867	3	7	3	11	Would it be possible to introduce confidence level wording after each of the statements of this paragraph? [Switzerland]	Confidence language has been added
20653	3	7	3	11	The paragraph cites section 1.2.1 as a reference but that section doesn't seem to include any text that is relevant to this paragraph. Please check. [United Kingdom (of Great Britain and Northern Ireland)]	Citation has been updated and verified
38193	3	7	3	11	This statement seems to miss a confidence statement as with the others in this section. [United States of America]	Confidence language has been added
24215	3	7	3	11	In the UN Sytem, countries are categorized as developed, developing and least developed countries/Parties. There is no UN formal countries categorization based on income being lower, higher or other, including how GDP issue iis approached. This paragraph may need to be reconsideration in its substance and reviwed according to UN formal countries categorization, unless this Special report is based on the World Bank countries categories. [Kamal Djemouai, Algeria]	This wording has been removed

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22037	3	7	3	11	A1.1- Please check: The confidence statement is missing [Suvadip Neogi, India]	Confidence language has been added
30333	3	7	3	17	Why refer to figure 2 first and not to figure 1? Consider changing the order of figure 2 and 1 [, Netherlands]	Done
22951	3	8	3	8	delete "related". The numbers seem to refer to agriculture as such, an a very narrow sense. Other parts of the report consider agriculture-related activities in a much broader sense that would imply a higher share. [Anastasios Kentarchos, Belgium]	The text has been changed
33435	3	8	3	8	Uncertainty assessment missing [Andreas Fischlin, Switzerland]	Now added
30019	3	8	3	8	the indication "1 to 25% of contries' GDP" does not make a lot of sense. Is it mainly close to 1% or close to 25%? A world average might be more informative. Or you might refer to different groups of countries, i.e. the percentage of GDP in developing countries vs developed countries (or other grouping based on the literature that is refered to in chapter 7.4.1). [, Netherlands]	The text has been changed accordingly
30417	3	8	3	8	Change '1% to 25%' to 'up to 25%'. [, Netherlands]	The text has bee changed accordingly
20645	3	8	3	8	The phrase '...which generated between 1% and 25% of countries' GDP.' is unclear, as it does not specify which countries are being referred to, and whether the percentage refers to an aggregate figure for those countries (with substantial variability) or a range of figures for each different country. An alternative phrasing could be '...which generated up to 25% of GDP in some countries.' [, United Kingdom (of Great Britain and Northern Ireland)]	This text has been changed accordingly
20647	3	8	3	8	Replace "between 1% and 25% of countries' GDP" with "up to 25% of GDP" for clarity. [, United Kingdom (of Great Britain and Northern Ireland)]	This text has been changed accordingly
41651	3	8	3	9	The juxtapositon of these two senences is jarring. I would not have expected a 'climate change' being invoked here. I cannot find the main point you want to get across [Michael Prather, United States of America]	The text has been edited
24471	3	9	3	10	This statement is quite weak in the context of AR5 data on the impacts of climate change on food production and the UNFCCC objective of ensuring that food production is not threatened; stronger wording in a separate point is warranted [, Ireland]	The text has been revised
20651	3	9	3	10	The term 'global mean surface temperature' may not be appropriate here. For example, the Tol 2014 paper referenced uses annual global mean surface air temperature; also, the Burke paper does not specify surface temperatures. The underlying text is more clearly discussing climate change. It may be better to say '...evidence suggests that economic activity in all regions of the world will be affected by climate change, with lower income countries suffering the greatest negative impact.' without specifying here how we are measuring that. Additionally, ensure that the text is clear that the references in the underlying chapter are not just discussing agriculture alone, which might be implied by the chosen wording here in the SPM [, United Kingdom (of Great Britain and Northern Ireland)]	The text has been changed, and data for this variable included in SPM Fig 1
25849	3	9	3	11	It is not clear if "economic activity" is related to agricultural systems only or a broader scope. In any cases, the two parts of the sentence could be switched to be more understandable. [, France]	The text has been revised
17519	3	9	3	11	What is the relevance of "economic activity" here? Investments in agriculture? [, Sweden]	Text has been changed
38195	3	9	3	11	This text lacks a confidence statement and is not supported by the referenced sections. [, United States of America]	Now added
13421	3	9	3	11	Is there no confidence level for this statement? [Lourdes Tibig, Philippines]	now added
15245	3	9	3	20	this statement needs traceable evidence and confidence level for the 75% ice-free land altered by human-being [Zhai Panmao, China]	Both have now been added

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7227	3	10	3	10	What is the magnitude of the effect? Is this the same for current, near- and long-term? Also, is the effect on the economy the same for all emission scenarios? [Debra Roberts, South Africa]	This part of the text has been completely re-written
20655	3	10	3	10	Climate change is affecting agriculture right now so saying economic activity "will be" affected casts the situation as something to worry about latter rather than an urgent issue now. Please rephrase to emphasise the immediate urgency of the climate change challenge [, United Kingdom (of Great Britain and Northern Ireland)]	The whole of section A1 and A2 is now focused on past and current issues for the land system, so this point has been adopted
4835	3	10	3	11	"Greater negative impact" seems better than "the greatest negative impact" in terms of grammatical connection with "lower income countries". Therefore, "the greatest" would need to be modified to "Greater". [, Japan]	The text has been changed
30025	3	11	3	11	Reference to Figure SPM 2 does not fit to the content of statement A1.1. [, Netherlands]	Noted and changed
17527	3	11	3	11	Reference to Figure SPM.2 would seem to come before reference to Figure SPM.1, which [reference] is also missing. [, Sweden]	Noted and changed
17773	3	11	3	11	There is a reference to Figure SPM 2, but nothing on this Figure supports the statement in this paragraph [Quentin Lejeune, Germany]	Noted and changed
33815	3	12	3	12	We suggest to quantify the current extent of land use by adding a parenthesis. Please consider to rephrase so that it reads: "The current extent of land use (about 75% of the ice free land area), together with" [, Norway]	This has been revised and updated
27889	3	12	3	12	What is the difference between human land use and and use? Only land use is defined in the glossary section [Itchell Guiney, South Africa]	This has been revised to avoid confusion
8787	3	12	3	12	Please check: The more general term is "land use" and not "human land use". [Jean-Luc Chotte, France]	Noted and changed
17523	3	12	3	13	This could be combined with first sentence in A1.3. [, Sweden]	The sections have been re-written
26057	3	12	3	13	The phrase "the large and rapidly increasing appropriation of the ecosystem services it provides" should be reworded. The term "appropriation" is unclear in this context (perhaps "diminution" is meant?), and the word "it" refers back to "human land use" but may be meant to refer to "nature". [Reid Detchon, United States of America]	The phrase has been re-worded, and the word appropriation no longer used
33437	3	12	3	17	Uncertainty assessment missing [Andreas Fischlin, Switzerland]	Added
24485	3	12	3	17	Including the % of high altitude land not used for food production is warranted [, Ireland]	Rejected. It is not clear from the comments why this should be the case.
4837	3	12	3	17	Each area mentioned here is the value in the year of 2015 in Table 1.1 of chapter 1. Due to the variability of land use area, we would suggest adding the corresponding year. [, Japan]	This has been added
33817	3	12	3	17	Associate the actual ice-free zone with time (Table 1.1). If it is current ice-free land (e.g. average over 2005-2016 period) you might consider to insert currently in front of ice-free in line 14. [, Norway]	These figures have been updated
38197	3	12	3	17	No mention of wetlands. Wetlands are an important category of land use that are important to understanding greenhouse gas fluxes from land, especially methane. [, United States of America]	Wetlands have now been included in SPM Fig1
7693	3	12	3	17	The character indicates 1000 is inconsistent. Both of 'K' and 'k' are used. These should be unified. [Hiroaki Kondo, Japan]	Noted and changed

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
919	3	12	3	17	Urban sprawls especially in developing countries are potential sources for contributing substantially to food production. Innovative horizontal and vertical farming with supportive policy and legal regime can boost food production in urban areas, and has the potential of bringing about a new food revolution in the world. Also, another landscape that requires concerted focus is deserts of the world. Controlling the spread of deserts to maintain fertility of existing productive lands is a correct approach, but increasing food production from the existing deserts is equally important. It is possible by starting with growing of shrubs and trees and slowly introducing other food grain crops. Reportedly, a farmer in Kuwarda Village in Jalore District of Rajasthan, India has grown 750 coconut palms in his arid land. The area gets <50 mm of rainfall annually. Traditionally, pearl millet is the main agricultural crop of Jalore District. Certainly, with concerted efforts, the wood, NWFP, and grain production can be substantially improved in desert areas. [Jagdish Kishwan, India]	This level of detail is beyond the scope of this section
33987	3	12	3	22	overlap: first part of A1.3 repeats A1.2. Please solve. [Elke Stehfest, Netherlands]	Redundancy resolved
26215	3	12	3	22	It is not clear how the figure of 75% of ice-land free land area that has been altered by human activity refers to the figures provided in paragraph A1.2 [, Luxembourg]	This has been updated to make the link much clearer
25851	3	13	3	16	It may be more relevant to put these in incremental order, to highlight better the most prominent "use". [, France]	Done
5291	3	13	3	16	The following wording is suggested: Of the total terrestrial surface area that is ice-free (~130MKm2) ~30% (40MKm2) is covered by managed (21%) and natural (9%) forests, ~25% (~32.7MKm2) is used for intensive (~2%) and extensive (~23%) pasture and ~12% (~15.9Mkm2) is cropland. [Klaus Radunsky, Austria]	This text has now been deleted from A1
17521	3	13	3	17	This does not appear as a key finding, but rather reference information, and could be omitted from SPM for increased brevity. [, Sweden]	The text has been revised accordingly
31517	3	14	3	14	Superscribed parentheses should be formatted on ice-free area [, Brazil]	Done
23767	3	14	3	14	the bracket after 130MKm2 may be removed from superscript [, India]	Done
3869	3	14	3	14	2nd bracket superscript [, Switzerland]	Done
25245	3	14	3	14	the bracket after 130MKm2 may be removed from superscript [Naresh Kumar Soora, India]	Done
2023	3	14	3	14	Check parenthesis after "2" superscript. [William Lahoz, Norway]	Done
30419	3	14	3	15	It doesn't seem to be logical to start with cropland if that comprises only 1/8 of the global land use. Introduce it as a part of agricultural land use as thee main land use category. An important conclusion is that of the ice free terrestrial area 37% is in agricultural use (of which 12% cropland and 25% grasland) etc. [, Netherlands]	Done
4211	3	14	3	15	Use km - not Km throughout. Change bracket format after "(130MKM2)" and add a comma after it. [Ralph Sims, New Zealand]	Done
38199	3	14	3	16	Pasture area is listed as "~32.7MKm2"; however, the referenced Table 1.1 from Chapter 1, Section 1.2.2, lists pasture area as 32.77MKm2, which should round here to, "~32.8MKm2". Forest area is listed as "~30%" whereas Table 1.1 lists forests as "30.8%", so the rounding should be to "31%". Similarly, managed forests are listed as "21%" here, and "21.6%" in the underlying chapter. Finally, the "remaining area" is listed as "33%", and appears to be the sum of "Urban and Built-Up Lands" and "Other Non-Forested Lands" from Table 1.1 in the underlying chapter, which sum to 31.8%, indicating the rounding should be to 32%. [, United States of America]	The figures are no longer included in A1, but those on SPM Fig1 has been verified

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
23765	3	14	3	17	The sentences may be refined for easy comprehension and also needs editing [, India]	Done
30027	3	14	3	17	Change "MKm" in "Mkm" (so the k should not be blod) in 4 out of 5 instances [, Netherlands]	Done
25243	3	14	3	17	The sentences may be refined for easy comprehension and also needs editing [Naresh Kumar Soora, India]	Done
24453	3	15	3	15	The global land use statistics reported here seem those from FAO. However where does the split between intensive and extensive pasture come from? Not from FAO [Francesco Tubiello, Italy]	The figures are no used in SPM Fig1 only, which includes the data sources in the caption
26211	3	15	3	15	Please add definition what intensive and extensive pasture is referring to [, Luxembourg]	This has been added
15167	3	15	3	16	the distinction between managed and natural forest used here is inconsistent with the definition of managed forest in the glossary, [Daniel Zarin, United States of America]	These have been checked
24455	3	15	3	16	Should the terminology for forest land use discriminate between managed and non-managed, aligned with IPCC terminology and FAO? There's plenty of 'natural' forests which are managed. [Francesco Tubiello, Italy]	Terminology has been checked
32237	3	16	3	16	9% refers to "Forested wilderness/primary forest" (Table 1.1 of Chapter 1). Natural forest are considered as Forests managed for wood production. [Carmela Cascone, Italy]	The categories have been changed and checked
3871	3	16	3	17	For the remaining area, only urban areas are specified with 0.6%. Deserts are mentioned, but no percentage is indicated. It would be useful to list other land types with percentage for the remaining area. [, Switzerland]	The land use/cover categories have been revised
38201	3	16	3	17	The primary land categories discussed in bullet A1.2 (ice-free area, cropland, pasture, forests) all list area (MKm2) and percentage of ice-free land, and subcategories then only list the percentage of ice-free land. For consistency, the remaining area should add in the area (MKm2) in addition to the currently listed percentage. Additionally, "deserts" and "urban areas" are included as subcategories of "remaining area", but "urban areas" include both an area and a percentage, whereas "deserts" are the only land type listed in this section without either a percentage or area. [, United States of America]	The numbers on the figure have been updated following advice from a graohic designer
8129	3	16	3	17	Check the value, 0.6% ~ should it be 0.78, not 0.73? [Haruni Krisnawati, Indonesia]	Checked
26213	3	17	3	17	Also add figures for the extension of desert areas [, Luxembourg]	The figure is about the use of land not about different types of landforms, deserts, mountains, coasts, ...
33819	3	17	3	17	Please also provide numbers for deserts. In addition, figures (size in Mkm2 and % of global ice-free land) of land cover/land uses should be consistence with figures listed as best estimates in Table 1.1. For especially desert and mountain areas it is not obvious to a non-spezialist readers in what category they fit. Most probably it is included in the Non-forested wilderness, but you shoud consider if this needs to be mentioned explicitly. [, Norway]	The figure is about the use of land not about different types of landforms, deserts, mountains, coasts, ...
20657	3	17	3	17	The percentage of land covered by deserts is currently missing and should be included for comparison with the other land types [, United Kingdom (of Great Britain and Northern Ireland)]	The figure is about the use of land not about different types of landforms, deserts, mountains, coasts, ...
24217	3	17	3	17	Its important to insert the deserts area ratio, showing that deserts are the biggest areas and central to such assessment. [Kamal Djemouai, Algeria]	The figure is about the use of land not about different types of landforms, deserts, mountains, coasts, ...
31789	3	17	3	17	I would suggest that it is worth mentioning wetlands here, given their significance with respect to ghg emissions and C storage. They feature prominently later in the document but somehow are missing in this first important paragraph in A1.2 [Samantha Grover, Australia]	Wetland declines have been included in SPM Fig1
30029	3	18	3	18	"determines" should be "determine" [, Netherlands]	Text re-written

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
31791	3	18	3	18	comma required after "decisions" [Samantha Grover, Australia]	Text re-written
20659	3	18	3	19	What about geology, biota and other factors that influence land cover? [, United Kingdom (of Great Britain and Northern Ireland)]	We do not have space to cover all of this issues in section A1
11635	3	18	3	19	IPCC certainty language is missing [Linah Ababneh, Sweden]	Now added
24483	3	18	3	22	The change of the % of managed land over history could be useful here, with perhaps an indication of the limits of what could be used under current management systems [, Ireland]	Agreed this is interesting, but we lack space to cover all of thee issues in A1
30335	3	18	3	22	A1.3 Topography and soil type are quite dominant in determining land use too. Consider adding them. [, Netherlands]	The text has been completely re-written
33821	3	18	3	22	Please consider elaborating and lift forward about 75% of the ice-free land area has been altered by human activity. [, Norway]	Now the main focus of SPM Fig1
27713	3	18	3	22	It is estimated that 75% of ice-free land are has ben altered by human activity. Yes, but it should also be made clear that human activities have increased the area if ice-free land. i.e. substantial land ice losses from increases in temperature and rain. [Helene Muri, Norway]	We reference this statement to a single year
1553	3	18	3	27	This development is puzzling, as what do humans do next after knowing it, what is to be done here? More education & contraception programmes could perhaps help mitigate some population growth, if local sensitivities undertaking concerning them are respected. Additionally, an increase in vegetarian diets could be encouraged, as they may help alter human animal-based consumption patterns here. [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	The text has been completely re-written
33439	3	19	3	19	Uncertainty assessment missing [Andreas Fischlin, Switzerland]	Now added
7233	3	19	3	20	It will be useful to add that there are regional differences and perhaps add the region(s) most affected. [Debra Roberts, South Africa]	Text has been re-written
25853	3	19	3	20	"altered" has a negative connotation. If this is what the authors want to say: fine, if not, consider the use of "affected" instead. [, France]	Text has been re-written
15169	3	20	3	20	should read "land cover and land use change influence global climate..." [Daniel Zarin, United States of America]	Change has been changed
22955	3	20	3	21	Please explain why the 75% statement is important. Has the number grown dramatically in recent years? Is it to imply that at this point almost all terrestrial processes should be considered anthropogenic to some extent? (link to B2.2) Also, biogeophysical is not typically used. Use biogeochemical processes for both global and regional climate. [Anastasios Kentarchos, Belgium]	We don't have accurate historic trends for this figure. Biophysical is an accpeted term in the literature
15855	3	20	3	21	This paragraph is not clear. I suppose that the idea is to insist that the " land-based climate change mitigation measures" are implemented in a sustainable way so as to generate/preserve ecosystem services. But the way it is written is confusing. [Caroline Vincke, Belgium]	The text has been completely re-written
4839	3	20	3	21	We would suggest having more clarify on the reason why it is possible to exclusively state that the biogeochemical processes affect the global climate and the bio geophysical processes affect the regional climate. [, Japan]	This is clearly stated in the literature on which this statement is based, and discussed in the full technical report
17525	3	20	3	21	Should include here that land use change drives climate change, or may be an aspect in miitigation. [, Sweden]	The land-climate interactions have been developed further, especially in SPM Fig 1
38203	3	20	3	21	Add meaning. Modify to "biogeochemical processes affecting greenhouse gases, and regional climate through biophysical processes impacting energy balance." [, United States of America]	This topic is no longer covered in A1. Text has been deleted

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
41657	3	20	3	21	This description is wrong. You forgot 'radiation', which is NOT part of biogeochemical. The land influences directly the radiative balance through albedo and aerosol (dust, VOCs, soot.). Maybe "through radiative and biogeochemical...". Basically, local radiative effects drive global climate and regional climate. The regional response may be larger, but a change in the radiative balance drive global climate. [Michael Prather, United States of America]	This topic is no longer covered in A1. Text has been deleted
29875	3	20	3	22	What are the main impacts and importance of these? [, Estonia]	Text has been completely re-written
30035	3	21	3	21	Reference to paragraph 1.2.2 should be 1.3.2, or - more precise - 1.3.2.1 Cross-Chapter box 1. [, Netherlands]	References have been checked and revised
30031	3	21	3	22	It is suggested that global climate is influenced only by biogeochemical processes, but the sum of biogeophysical processes at the regional scale could result in a global signal and therefore global climate could also be influenced by biogeophysical processes. I think it is more correct to add to word "mainly" before the word "through" (two times). [, Netherlands]	This topic is no longer covered in A1. Text has been deleted
30421	3	22	3	22	Reference can be made to figure 2 in relation to the 25% pristine land unchanged by humanity (wild forests and wild barren land) [, Netherlands]	Not sure what this means
24487	3	23	3	23	Some quantification should be provided of large scale deployment of land-based mitigation measures - see SR1.5 [, Ireland]	This topic is no longer covered in A1. Text has been deleted
2967	3	23	3	23	land-based' should be clarified (in glossary?) , because reductions in power plant emissions are also land-based! [, Russian Federation]	The glossary has been updated
26039	3	23	3	23	The statement in Chapter 2 refers to mitigation pathways that lead to 2C or below, not all mitigation pathways. Suggest revising text to: that limit global warming to 2C or below entail... [Haroon Kheshgi, United States of America]	This topic is no longer covered in A1. Text has been deleted
40257	3	23	3	23	... limit global warmig to low levels relative to pre-industrial levels... [Thelma Krug, Brazil]	This topic is no longer covered in A1, and the text has been deleted
33441	3	23	3	24	I find this confusing. To my knowledge there are many AR5 scenarios (e.g. as resulting from climate model runs) that do not well define or at least not consistently specify land-based mitigation measures. Since the reference here is made to "modelled pathways" I would assume authors mean here indeed pathways that are building on climate model outputs. Perhaps I do merely not well understand what the authors are referring to and have in mind, which means a text clearer in this respect is in any case needed. [Andreas Fischlin, Switzerland]	This topic is no longer covered in A1, and the text has been deleted
31519	3	23	3	24	land-base cc mitigation measures have a contribution to the efforts to limit gobal warming. It might be that decisions made to model pathways to achieve the goals emphasized such measures. However, this is a choice made, and the exclusion of measures in other sectors, and their contribution, is questionable. [, Brazil]	This topic is no longer covered in A1, and the text has been deleted
4841	3	23	3	24	It is inferred from the sentence that "most modelled pathways" mean "most pathways corresponding to the 2 °C and 1.5 °C targets". If it is so, this line of clarification is requested. [, Japan]	This topic is no longer covered in A1. Text has been deleted
26217	3	23	3	24	This sentence seems quite general, please provide figures for different levels of global warming [, Luxembourg]	SPM Fig 1 now includes figures on global warming of land and oceans
33823	3	23	3	24	If possible, quantify the number of pathways that are not reliant upon large-scale deployment of land-based mitigation options. Also, we think it would be useful to specify the different mitigation option(s) that are most prudent in all mitigation pathways (with or without large-scale deployment of land-based mitigation options). [, Norway]	This topic is no longer covered in A1, and the text has been deleted

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
20661	3	23	3	24	"Land-based climate change mitigation measures" needs defining or replacing with a different phrase which is defined. See more detailed comment against SPM p.21 lines 1-8. [United Kingdom (of Great Britain and Northern Ireland)]	This topic is no longer covered in A1. Text has been deleted
29231	3	23	3	24	I don't think you need a "high confidence" statement here. This is just an observation based on available scenarios. [Jan Fuglestedt, Norway]	Agreed. The text has been edited
17777	3	23	3	24	The sentence "most modelled pathways that limit global warming" does not specify to what level of warming. The formulation of the whole paragraph is rather simplistic - what does "widespread uptake of sustainable land management" mean? And what about the implications of different mitigation pathways (with different amounts and portfolios of CDR) for SDGs that depend on land-based ecosystem services? The context is missing here. [Quentin Lejeune, Germany]	This topic is no longer covered in A1. Text has been deleted
26061	3	23	3	24	Amend "the large-scale deployment of land-based climate change mitigation measures" to read: "the large-scale deployment of land-based carbon dioxide removal options such as reforestation and afforestation and bioenergy with carbon capture and storage." [Reid Detchon, United States of America]	This topic is no longer covered in A1. Text has been deleted
32803	3	23	3	27	This wording reifies the pathways as real and limits land-based mitigation options under consideration to those that researchers have decided to incorporate into IAMs. Delete the first sentence and replace with the sentence from chapter 1 executive summary, page 3, lines 25-27. [Doreen Stabinsky, United States of America]	This topic is no longer covered in A1, and the text has been deleted
33989	3	23	3	27	only "sustainable land management" is mentioned as condition to avoid large-scale CDR deployment to jeopardize other SDGs. Other measures are necessary and should be mentioned, especially the ones reducing land demand like yield increases, waste reductions, dietary transition. chapter XXX [Elke Stehfest, Netherlands]	Response options are discussed in detail later in the SPM and is beyond the scope of A1
33991	3	23	3	27	Only the first sentence of A1.4 seem well-placed in the section Land-climate interaction (climate mitigation affects land-use). The second statement does not fit this section, or needs to be re-formulated, as a factual statement that also measures to avoid negative interference of land-based mitigation with other SDGs will affect land systems. [Elke Stehfest, Netherlands]	This topic is no longer covered in A1, and the text has been deleted
27533	3	23	3	27	We encourage the authors to clearer state which type of mitigation measure might cause trade-offs and to clarify which SDG's achievement might be jeopardised. Further, it would be very helpful to concretise and even quantify the role of sustainable land management in avoiding trade-offs. [Germany]	This topic is no longer covered in A1. Text has been deleted
30033	3	23	3	27	Statement A1.4 is very vague. Limit global warming to what degree? 1.5 degrees or 2 degrees? What land-based climate change mitigation measures? Based on section 1.3.2 I suggest to change formulation into "limit global warming to 2 or 1.5 degrees" and add that the most important land-based mitigation measure is the production of biomass. Also refer to Figure SPM 1 that sums up three land-based mitigation measures. [Netherlands]	This topic is no longer covered in A1. Text has been deleted. SPM Fig 1 covers this issue instead with updated figures
30337	3	23	3	27	A1.4 is difficult to read. Does it say: It is important to find synergies in land use solutions to combat climate change and to achieve sustainable development? [Netherlands]	Agreed. Text has been completely revised
33825	3	23	3	27	A1.4 contains important information and it should be kept as part of SPM. [Norway]	This topic is treated elsewhere in the SPM

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
28699	3	23	3	27	"most modeled pathways..." - This broad recognition of potential problems with large scale deployment is welcomed but the solution referred to "sustainable land management" remains undefined and far too broad and open to interpretation. Literature on bioenergy, tree plantations (afforestation/reforestation) even at current scale results in serious problems, food competition, land grabs and loss of biodiversity. IPCC should focus on restoration of natural ecosystems and agroecological farming practices - and avoid technological approaches that would vastly increase demand for biomass such as BECCS and biochar. The scale of demand is already too great, and unsustainable. Scale of demand, when too great, cannot be achieved sustainably. Hence the term "sustainable land management" should be detailed to reflect the need to reduce demand to more sustainable levels. [Rachel Smolker, United States of America]	Agreed, The text has been edited accordingly
26059	3	23	3	27	This critically important introductory section would greatly benefit from an additional paragraph providing greater tonal balance - either before or after A1.4 - summarizing the opportunities for and benefits of pro-active response options, as discussed below in this chapter in C1, C3, D1 and D2. For example, from the Executive Summary in Chapter 4: "Most forms of land degradation can be prevented and reversed with adequate actions (very high confidence). Proven methods and approaches exist for avoiding, reducing and reversing land degradation under the umbrella term Sustainable Land Management (SLM) {4.10.1, 4.10.2}." [Reid Detchon, United States of America]	Response options are discussed in detail later in the SPM and is beyond the scope of A1
22039	3	23	3	27	A1.4-Please check: 'Modelled pathways'.....projections based on scenarios? Please specify; 'land-based climate change mitigation measures'.....what are the measures? Please specify; 'sustainable land management'.....have disagreement on using this term, please check whether any other phrase can be used. [Suvadip Neogi, India]	This topic is no longer covered in A1. Text has been deleted
6849	3	24	3	24	Delete the this part of the sentence "without the widespread uptake of sustainable land management" - as this implies that such widespread uptake is feasible in the short term, and that widespread implementation of bioenergy production on the scale proposed by many mitigation scenarios is feasible and desirable. [Markus Giger, Switzerland]	The sub-section has been deleted
25033	3	24	3	25	Sustainable land management (SLM) cannot be the only recipe. It is broad and difficult to measure and justify whether SLM result in CO2 sinks and adaptation or increased emissions and vulnerability. [Binaya Shivakoti, Japan]	The sub-section has been deleted
31521	3	24	3	25	The affirmation is unclear. The text associates the feasibility of mitigation measures at the long run to the uptake of sustainable land management, with is ok, but insufficient in a context to climate change, as discussed in this paragraph. In that case it is fundamental that this paragraph be emended to include "Without the widespread uptake of [adaptation actions and]" [, Brazil]	The sub-section has been deleted
23753	3	24	3	25	Without the widespread uptake of sustainable land management: May like to give some examples in brackets. Otherwise too vague and general. How will policy makers know what is sustainable land management ? [, India]	The sub-section has been deleted
26063	3	24	3	25	Amend "Without the widespread uptake of sustainable land management" to read: "Without the widespread adoption of sustainable management practices in agriculture, forestry and soils and related supply chains, however," [Reid Detchon, United States of America]	The sub-section has been deleted
15291	3	24	3	27	Suggest rewording the statement to be, for example, ' The widespread uptake of sustainable land management practices will allow an alignment of land based mitigation measures and sustainable development goals.' [, Australia]	The sub-section has been deleted

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
20663	3	24	3	27	Without the widespread uptake of sustainable land management, achievement of the Long Term Temperature Goal will also be more challenging and should be mentioned explicitly here. [United Kingdom (of Great Britain and Northern Ireland)]	The sub-section has been deleted
6663	3	24	3	27	It was noted that "land -based ecosystem services" matters for SDGs achievement. However, would emphasis on land alone be enough? In small islands, the wholism of ridge to reefs matters for mitigation and especially adaptation. Further, we can not ignore the importance of life below water in the greater algorithm (may link to A.3.1) [Mochamad Indrawan, Indonesia]	Whilst this is an important issue it is beyond the scope of a special report on land. The is another special report on marine
17361	3	25	3	27	This paragraph should take the current biodiversity crisis into account and therefore should refer to the potential of land based mitigation measures that jeopardize the survival of large parts of global biodiversity as a key factor to ensure environmental integrity, healthy ecosystems, ecosystem resilience and therefore resilient ecosystem services to humans that support adaptation and the achievement of the SDGs. [Taehyun Park, Republic of Korea]	The sub-section has been deleted
8833	3	26	3	26	state the SDG goals likely to be jeopardized (Goals 2, 11, 12 and 15) [Jean-Luc Chotte, France]	The sub-section has been deleted
27891	3	26	3	27	Insert the word goods. ... ecosytem goods and services... [Itchell Guiney, South Africa]	The sub-section has been deleted
32995	3	27	3	27	...services (high confidence). Although nature-based solutions are often overlooked, they may offer low-risk approaches to climate change mitigation and adaptation while safeguarding land-based biodiversity and ecosystem functions and services. {SR1.5; 1.3.2} [Christopher Pereira, Canada]	The sub-section has been deleted
20665	3	27	3	27	Insert something along the lines of "...the depend on land-based ecosystem services, such as food security, as well as negatively influencing biodiversity". [United Kingdom (of Great Britain and Northern Ireland)]	The sub-section has been deleted
26065	3	27	3	27	Change "SR1.5; 1.3.2" to "1.3.2; 1.4; 1.5.3" [Reid Detchon, United States of America]	The sub-section has been deleted
33827	3		3		It would have been useful to see a figure rather early in the report showing different land use categories and the associated GHG emissions and net removals. Consider including a new para A1.5 that explains estimates of net AFOLU emissions and net removals (2.4). [Norway]	Agreed. This is now included in SPM Fig1
22953	3	12	5	7	Statement A1.2 and SPM2 should be combined and converted into a high-level explanation of what is driving land use/cover changes at global level. The text in A1.2 needs to include information about change over time (and/or comparison with projected land uses in <2°C scenarios). Fig SPM2 needs a box showing global level information (as well as the regions). [Anastasios Kentarchos, Belgium]	The text (especially in A2) has been revised to be more specific about the causes of change (drivers)
16865	3	1	12	23	There is a wide-spread habit in policy discussions to include all land sink on managed lands to net emissions calculations, which is giving a high bias for estimating anthropogenic removals of CO2. Then countries use those numbers to estimate their net-zero targets to be compatible with the 1.5-degree carbon budgets presented by IPCC and the goal of having net-zero emissions by 2050. The SPM scould address the topic of net emissions and net-zero emissions explicitly. The text should be more clear on how to estimate the land sink in a consistent way with e.g SR15 net emission definition, and also provide some examples which sinks cannot be included in the calculations of anthropogenic carbon sink to be consistent with SR15 definitions. [Antti-Ilari Partanen, Finland]	This is beyond the scope of A1, which now has a reduced GHG sink/sources focus, these issues being treated elsewhere

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
22949	3	1	12	24	<p>Section A general comment - more context needed for facts and terminology</p> <p>The SPM contains a number of facts and statistics that need more context and/or explanation in order to be meaningful SPM messages. For example:</p> <p>* A1.1 the figures on employment and GDP need to be accompanied by an explanation of why the people/ countries more directly exposed to agriculture are more vulnerable to the CC-land nexus than others (e.g. it is not immediately obvious why people/ regions directly involved would be more vulnerable than net importers far away).</p> <p>* A2.2 & A2.3 terms such as 'novel degradation pathways', 'new hot climate zones' and 'multi-food basket failure' sound dramatic. Are these terms scientific? If so, please ensure they are explained (with the explanation traceable from the SPM).</p> <p>* A2.3 the concept of people 'directly affected' (as opposed to indirectly) needs better explanation. [Anastasios Kentarchos, Belgium]</p>	The figures have been updated and checked across the section
2135	3	1	12	24	<p>Policymakers need to understand that while 1 ton of forest carbon stocks affects the climate similarly no matter where it is or the type of forest, that is not true for the non-GHG pathways. The location, type, age, and scale of vegetation affect the albedo, evapotranspiration, aerosols, surface roughness etc. Not all forests have the same impact on climate change. [David Kaimowitz, Nicaragua]</p>	This issues is now treated in more detail in other key messages
30373	3	1	12	24	<p>Chapter A does not pay enough attention to forests an other terrestrial and coastal ecosytems including, wetlands, savannahs, natural graslands, seegrass-extends, mangroves. The role these natural ecosystems play in the global climate system and food systems, livelyhoods, economies cannot be dealt with in textbox SPM 1 alone. Tropical deforestation alone causes a net emission of 12% of the LULUCF sector globally. The boreal taiga forests need special attention too; the permafrost that is prone to thaw and methane emssions, but extension into it of the taiga forest is also important to mention. Next to tropical deforestation and forest degradation and wetland degradation. [, Netherlands]</p>	These ecosystems are now treated explicitly in SPM Fig 1, and the extended caption that accompanies it
20641	3	1	12	24	<p>It would be helpful to create a new section (which could be an A7) that explicitly discusses some of the human risks due to climate change, as they are currently spread throughout section A and it is not immediately obvious that some of these risks have multiple drivers. Paragraphs A2.3, A3.5, and A5.6 could be moved into this section; key findings expressed in figure SPM3a could also be discussed in it, and other key messages from the underlying chapters could be elevated to it, such as 'Climate and land degradation can act as threat multipliers for poverty and vulnerability' (Chapter 4, p4-5, lines 44/45), 'Increased dust sorm activity because of desertification and climate change has a high poential for negative human health impacts due to associated respiratory and cardiovascular illness' (A5.5), as well as other findings from Chapter 7 section 7.3.2. [, United Kingdom (of Great Britain and Northern Ireland)]</p>	Agreed. This has been done with the introduction of a sun-section on health implications, and a broader treatment of human well-being deriving from ecosystem services
30411	3	1	23	7	<p>In part A more attention should be paid to regional differences of climate impact to land use systems. This could be illustrated by a land use map with current and future climate impact indicators under different global temperature rise scenarios. Such maps would be helpfull in part B to be able to table regional or zonal land use challenges under projected climate change. [, Netherlands]</p>	This is beyond the scope of A1, which is now expressing the importance of land systems for humanity, and not focusing on climate change impacts. Thic comes later in the SPM

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
8207	3	1	30	39	<p>In the SPM the need for land for forest and bioenergy/BECCS is quantified in B3. Page 18 line 5-10. The potential for reduction of GHG-emissions from diet changes, cutting loss and waste is mentioned and quantified a number of places in the SPM, but reduction in need for land is only mentioned, without any figures for the reduction in land need are given, even when they can be found in the main report.</p> <p>Would it be possible to put these figures more systemetically together in such a way that comparison is possible? And with a short discussion and concluding text, including mentioning the barriers. In the Executive summaries of the relevant chapters and especially in the SPM e.g under B3 page 18, since it would be of high importance for policy makers.</p> <p>For a number of readers, e.g. Policymakers, it could be useful to see the figures for land need and -savings in context with figures for the global area of cropland (1590 Mha, 15,9 Mkm²) -, pasture 3270 Mha, 32,7 Mkm² and forest 4000 Mha, 40 Mkm², given in the SPM, page 3 line 14 – 15. Would it be possible to put this in the SPM) [Harold Leffertstra, Norway]</p>	The bioenergy/BECCS issue is now not covered by A1, but treated only in other sections of the SPM. The land area figures have been updated in SPM Fig 1
25129	3		30		<p>Readability could be improved by providing sub-headlines to the sub-sections (A1, A2 etc.) Sometimes the subject category is not immediately clear [Alexander Erlewein, Germany]</p>	This has been done
23283	3		30		The SPM remains somewhat unbalanced with 22 pages on the problems and 6 on the solutions. [Mark Howden, Australia]	Agreed. The text has been completely re-written
23251	3	5			simplify 'important role in responding to and adapting to climate change' to 'an important role in climate change mitigation and adaptation'. The original formulation seems to indicate that climate adaptation is not a response to climate change – when self-evidently it is. [Mark Howden, Australia]	A1 no longer addresses issues around adaptation or mitigation
27529	3	8			Some countries strongly depend on agriculture - can it be true that only 25% of their GDP is generated by agriculture? Please check. [, Germany]	The figures have been checked (and changed)
16399	3	8			Add 'agriculture and' between 'from' and 'agriculture-related activities' to make context more obvious. [, Republic of Korea]	The text has been edited
20649	3	8			"which generated between 1% and 25% of countries' GDP". Assume this is a range (rather than uncertainty). Please clarify. [, United Kingdom (of Great Britain and Northern Ireland)]	Correct and now clarified
16391	3	11			Figure SPM 2 --> Figure SPM 1 [, Republic of Korea]	Noted and changed
2063	3	13			Very high [Tomas Molina, Spain]	Not sure what this means
16393	3	14			Please add ", " before "~12%(~15.9Mkm ²)". [, Republic of Korea]	Text changed
8123	3	14			Check the value! 12% of 130 Mkm ² , should it be 15.6, not 15.9? [Haruni Krisnawati, Indonesia]	Checked
8125	3	14			Check the value!, 25% ~ should it be 32.5, not 32.9? [Haruni Krisnawati, Indonesia]	Checked
27779	3	14			please add ", " after "ice-free (~130Mkm ²)" [Raehyun Kim, Republic of Korea]	Text changed
27531	3	15			A quick web search revealed that there is no clear definition of "extensive/intensive pasture" and it is not defined in this report. Therefore we suggest to better not use these expressions at all - and even less so in the SPM - or at least defining them in the glossary. [, Germany]	This is described in Chapter 1
8127	3	15			Check the value, 30% ~ should it be 39, not 40? [Haruni Krisnawati, Indonesia]	Checked
16395	3	17			Km ² -->km ² [, Republic of Korea]	Done
41653	3	17			Please give the size of deserts to complete the picture. [Michael Prather, United States of America]	The figure is about the use of land not about different types of landforms, deserts, mountains, coasts, ...

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41655	3	19			The 75% is a powerful number, but it needs some traceability to the literature and chapters. [Michael Prather, United States of America]	This is now done through Chapter 1
2065	3	21			Very high [Tomas Molina, Spain]	Not sure what this means
41659	3	23			modelled' is an odd word here. These are more than just modeled, they are designed, proposed, ... How about "explored" [Michael Prather, United States of America]	This topic is no longer covered in A1, and the text has been deleted
41661	3	24			uptake' is also an odd word choice, in much of the science here, it would be used for nutrient uptake, not people uptake. Try "adoption" [Michael Prather, United States of America]	The sub-section has been deleted
32239	3	26			Delete comma between "land-based" and "ecosystem services" [Carmela Cascone, Italy]	The sub-section has been deleted
18317	3				"Without the widespread uptake of sustainable land management". What is SLM in this context? Since this is the first occurrence of the term and is proposed as a solution, it should be defined/clarified upfront. [Edouard Davin, Switzerland]	The sub-section has been deleted
22957	4	1	4	1	Dietary changes and food waste to be moved from 'Adaptation' to either 'Mitigation' or 'Food security' [Anastasios Kentarchos, Belgium]	Noted. SPM1 has been comprehensively redrawn, the previous labelling (1 - 5) of the themes of the report have been removed.
22959	4	1	4	1	Figure SPM 1 should be further elaborated and redesigned, e.g. 1. Mitigation should contain restoring wetlands and peatlands, 2. Adaptation should also contain consumer change, 3. within Desertification - managing soil erosion should be extended of overall soil management,.. Increasing soil organic matter is more relevant for 4. Land degradation. Managing pollution and invasive species should be replaced by Managing pollution, Managing biodiversity. [Anastasios Kentarchos, Belgium]	Noted. SPM1 has been comprehensively redrawn, the previous labelling (1 - 5) of the themes of the report have been removed.
12583	4	1	4	1	Given the importance of dietary change and the reduction of food waste (in addition to losses) in fostering food security, as comprehensively detailed in the body of the report, I think it is essential that these examples are included in Figure SPM1. I therefore strongly recommend adding changing the bullet: Reducing post-harvest losses to: 'Reducing food loss and waste' and adding a bullet: Supporting a transition to healthy, low-carbon diets [Carina Millstone, United Kingdom (of Great Britain and Northern Ireland)]	Partially accepted. SPM1 has been comprehensively redrawn and now includes a sub-panel (b) which focuses specifically on the food system. Including data on post-harvest losses and food waste is beyond the scope of the figure but food waste is mentioned in the figure caption (and extensively in Section B of the SPM text)
17499	4	1	4	1	Figure SPM1 in Mitigation lacks the option of reducing deforestation, which could be one of the biggest opportunities for mitigation in land use. [Dirk Nemitz, Germany]	Noted. SPM1 has been comprehensively redrawn, the previous labelling (1 - 5) of the themes of the report have been removed.
31523	4	1	4	1	There are three categories of land degradation, but the figure of a human is represented only in the "degraded" one. We suggest removing this figure because it is possible to have a "sustainable" land with humans working on it. There is also a figure of an airplane but it adds nothing to the discussion. [Brazil]	Partially accepted. SPM1 has been comprehensively redrawn and icons removed from the much simplified central illustration which now only shows land cover.
31525	4	1	4	1	The graph, item (5) is missing a reference to "integrate systems", my suggestion is that it be included alongside with Agroforestry, with is a type of integrated system but not sufficient to characterize the complexity and diversity of integration systems. [Brazil]	Noted. SPM1 has been comprehensively redrawn, the previous labelling (1 - 5) of the themes of the report have been removed.
31527	4	1	4	1	figure: assumes that tropical natural landscapes are exclusively rain forests and that degradation, in the different zones, imply agricultural activities. To be deleted. [Brazil]	Noted. SPM1 has been comprehensively redrawn and the simplified central illustration which now only shows land cover.
21853	4	1	4	1	In Fig. SPM 1, regarding the bullet points under 1. Mitigation, it would be more consistent to mention both bioenergy and bioproducts, because particularly in forest industry value chains, energy and products are often inseparable, i.e., the production of modern wood-based bioenergy is to a significant extent conditional on the sidestream and byproduct availability from the production of wood-based products. [Finland]	Noted. SPM1 has been comprehensively redrawn, the previous labelling (1 - 5) of the themes of the report have been removed.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
27537	4	1	4	1	<p>We appreciate this figure in the SPM as it provides a useful introduction to the report. We have however some questions and suggestions for improvements:</p> <ul style="list-style-type: none"> - We strongly urge the authors to mention "climate change" as the sixth land challenge, as done in chapter 6-19. - The lists under the numbered items do not seem consistent, e.g. the bullets under food security, mitigation and adaptation refer to the actions supporting these three issues. However, the bullets under desertification and land degradation refer to actions combatting them. - The selection of examples under the numbered items appears very arbitrary and counter-intuitive. Adaptation: insurance systems and SLM to be added; Mitigation: move "peatland restoration" from Land Degradation to mitigation because of paramount and still broadly underestimated importance for land based emissions / emission potentials; Land degradation: add erosion, salinization etc.; Food Security: add socio-economic aspects (access to food / purchase power) to the list of production and processing aspects, or rename: "physical food availability". - The figure wrongly suggests that there are no natural deserts or tundra that are not "degraded" due to human influence. This could be fixed by the suggested SPM-box on concepts that clarifies that in this report, LD exclusively refers to human caused degradation. - Water is not explicitly mentioned in this figure, wouldn't this be of relevance too? [, Germany] 	<p>Partially accepted: - The figure has been extensively redrawn</p> <ol style="list-style-type: none"> 1) Climate change over land (temperature) is now specifically shown in panel F. 2) The lists of report themes (1 - 5) has been removed from the figure 3) The degradation - climate gradient visualisation has been removed and the central figure now focuses on land cover (and level of intensity of land use) 4) Water is now specifically mentioned in terms of irrigated land (central panel) and volume of water used for irrigation (Panel C)
27539	4	1	4	1	<p>Why are desertification and land degradation separated, should it then be "other land degradation", or do you consider desertification being no land degradation? Please explain the structure of the land challenges. [, Germany]</p>	<p>Noted. SPM1 has been comprehensively redrawn, the previous labelling (1 - 5) of the themes of the report have been removed.</p>
30341	4	1	4	1	<p>Figure SPM 1: An interesting figure introducing the concept of a two axes with gradients from climate zones from equator to pole and form pristine ecosystems to degraded cause of human over exploitation. However it is more successful as a concept than as a picture, because reality is much too complex to do justice to all land use and over exploitation issues. The 5 challenges are just not elaborated complete enough (un/sustainable land use for instance should be mentioned under '5 food security' and '4. land degradation' and maybe all other challenges). Also, greenhouse gas fluxes and energy exchange do not have a logical relation with the matrix. And why is there a plane in the picture? Overall the balance in this picture is not right yet. It might be better to separate this concept from the challenges discerned. Or to relate the challenge more to the gradient from sustainable use to overexploitation leading to land degradation. And superimposed on that the interactions with climate change. Some of the points are better reflected in Figure SPM3a [, Netherlands]</p>	<p>Noted. SPM1 has been comprehensively redrawn. The central visualisation has been much simplified, now focusing on only one dimension - land cover. The previous labelling (1 - 5) of the themes of the report have been removed. Further quantification of changes to the land system (and climate system - in terms of temperature) have been added to the figure as separate panels.</p>
33831	4	1	4	1	<p>Figure SPM 1: In its current format it is challenging to grasp if there are any thoughts behind the actual placement of the textual information provided for 1., 2., 3., 4. and 5. or not. E.g. Why is 1. Mitigation placed in the atmosphere, and why are only "3. Desertification" and "4. Land degradation" linked to the y-axis in the figure.</p> <p>We see that climate and vegetation gradient are described from the equator to the pole, but how is vegetation gradient defined, species composition or diversity? And are this in a descending order E.g. are there more vegetation in semi(arid) than temperate? The main limiting factor in arid/dryland environment is moisture. Thus, soil-water management is another crucial issue you should try to highlight and explain to the readers. [, Norway]</p>	<p>Noted. SPM1 has been comprehensively redrawn, the previous labelling (1 - 5) of the themes of the report have been removed. The central visualisation of SPM1 has been simplified and now focuses on a single dimension - land cover.</p>

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33833	4	1	4	1	Figure SPM 1: Please consider to replace the word sustainable in the y-axis of the figure with either managed or human influenced. Rationale: In our view, to fulfill or achieve sustainability a vital prerequisite is that there will always need to be a certain amount of unmanaged natural and pristine land areas left. With sustainable written in the y-axis alongside natural this might be misunderstood in a way that all pristine areas could be sustainably managed. [, Norway]	Noted. SPM1 has been comprehensively redrawn, two dimensional central illustration has been replaced with a simpler visualisation of land cover.
33835	4	1	4	1	Figure SPM 1: Please consider revising why acidification is listed under Desertification. Acidification is usually associated with high precipitation due to leaching. In (semi-) arid environments, since evapotranspiration is by far higher than precipitation, soil salinization is therefor a common process that should be considered in sustainable land management. [, Norway]	Noted. SPM1 has been comprehensively redrawn, the previous labelling (1 - 5) of the themes of the report have been removed.
33837	4	1	4	1	Figure SPM 1: In this conceptual figure, consider to associate information from carbon budget model (e. g., MtCO ₂ eqv or Carbon stock/sink). Figure 4.1 shows the concept of how land uses moves from a natural to a used state. Please consider to find a way to communicate these perspectives for the different climate zones. [, Norway]	Partially accepted: More quantitative data is provided in the new version of the figure. Panel E now shows historical trends in GHG emissions. However the figure does not show future scenarios as this is beyond the scope of this figure.
33839	4	1	4	1	Figure SPM 1. Consider including "conservation" under 1. Mitigation, as this is one of the primary and main responses in tropical countries [, Norway]	Noted. SPM1 has been comprehensively redrawn, the previous labelling (1 - 5) of the themes of the report have been removed.
6041	4	1	4	1	Add: 4.Sustainable forest management, 5. Managing fire, The above are important response options that have a substantial contribution to climate change mitigation. This is also highlighted on p.15 (Figure SPM 1.) [, Poland]	Noted. SPM1 has been comprehensively redrawn, the previous labelling (1 - 5) of the themes of the report have been removed.
17529	4	1	4	1	Figure SPM.1, should add "agricultural practices" or suchlike under "1. Mitigation" at the top of the figure. Cf. B1.4. [, Sweden]	Noted. SPM1 has been comprehensively redrawn, the previous labelling (1 - 5) of the themes of the report have been removed.
17531	4	1	4	1	Figure SPM.1, would it be possible to highlight also connections (incl. synergies/goal conflicts) between the five groups of aspects? [, Sweden]	Noted. SPM1 has been comprehensively redrawn, the previous labelling (1 - 5) of the themes of the report have been removed.
38205	4	1	4	1	Should geoengineering be added under Adaptation? [, United States of America]	Noted. SPM1 has been comprehensively redrawn, the previous labelling (1 - 5) of the themes of the report have been removed.
38207	4	1	4	1	The adaptation category in this figure should also include Climate-Smart Agriculture. [, United States of America]	Noted. SPM1 has been comprehensively redrawn, the previous labelling (1 - 5) of the themes of the report have been removed.
8759	4	1	4	1	The graphic separates desertification from land degradation, when the former is a subset of the latter. This is potentially confusing. Recommend combining under Land Degradation only. Additionally, the graphic should include Sustainable Land Management as options for 1. Mitigation, 2. adaptation and 4. land degradation [Jean-Luc Chotte, France]	Noted. SPM1 has been comprehensively redrawn, the previous labelling (1 - 5) of the themes of the report have been removed.
29729	4	1	4	1	Unfortunately the icons / pictures are too small and hard to discern, meaning they are not useful. The reader gets quite bogged down in trying to ascertain what the icons/pictures are depicting and this blurs the bigger message. I think the challenge for the designer and authors, for the next iteration, will be to streamline this graphic. It is ambitious to try and squeeze into the same graphic both a boreal -> tropical axis as well as a natural -> degraded axis. I would recommend that you focus on the natural -> degraded axis and depict this spectrum (of land integrity) with clearer, simpler artwork. [Mairi Dupar, United Kingdom (of Great Britain and Northern Ireland)]	Noted. SPM1 has been comprehensively redrawn and icons removed from the much simplified central illustration of land cover.
29731	4	1	4	1	Regarding the text in the Figure SPM-1: I think the overall headings and the bullet points beneath them are very easy to follow and the eye is drawn toward these. The text is more effective than the artwork per se. However, I would suggest that you should make these bullet lists slightly more comprehensive, in terms of their content. For instance, neither the 'Adaptation' nor the 'Mitigation' point contains any bullets about agriculture, which seems strangely remiss-? [Mairi Dupar, United Kingdom (of Great Britain and Northern Ireland)]	Noted. SPM1 has been comprehensively redrawn, the previous labelling (1 - 5) of the themes of the report have been removed.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
29733	4	1	4	1	Furthermore, regarding Figure SPM-1 (and elsewhere in the framing and phrasing of the SPM) shouldn't the term 'land challenge', rather, be phrased as 'land management challenge' as I think you are trying to posit 'which responses should decision-makers consider in order to manage the land for adaptation, for mitigation, against land degradation, etc...' [Mairi Dupar, United Kingdom (of Great Britain and Northern Ireland)]	Noted. The redrawn figure does not use a 'land challenge' framing
32377	4	1	4	2	In light of its positive impacts on GHG emission reductions, dietary change should be categorized under 1. Mitigation measures in Figure SPM 1, in line with the findings in Chapter 5 (5.4.6). It is an important element of Food Security too, especially in light of its positive health impacts. [Simone Lovera-Bilderbeek, Paraguay]	Noted. In the redrawn figure historical dietary change is shown in Panel B, as a driver of land use change. This figure does not deal with mitigation potential of different response options but that is dealt with in the new Figure SPM3
28295	4	1	4	12	This is a useful Fig. that takes on an integrated approach to differentiate between transformation/SLM and desertification, thus providing a basis for integrating human-wellbeing (e.g. food security) in attempts to avoid, reduce or reverse land degradation /desertification. You may wish to include the following terms under the specific header so that the figure is better linked to the chapter contents and the other parts of the SPM: Point 2. Adaptation: Please include sustainable land management (SLM) besides sustainable forest management (SFM) (see chp. 4). Including SLM here would also better reflect components of the title of the SR in this Figure. Point 3. Desertification: Please include the aspect of 'secondary salinization' and 'nutrient depletion'. It would read: "Managing soil erosion, acidification, secondary salinization and nutrient depletion." (see chp. 3). Point 4. Land Degradation: What about sustainably managing pastures and forests? It would read Managing pollution, pastures, forests and invasive species. These are aspects that need to be addressed under land degradation as well and not only under point 5. on food security. In general: it would be very useful if Fig. SPM.1 reflects on the information on land use and land cover provided under A1.2 (p. 3, L12-17). [Barron Joseph Orr, Germany]	Noted and partially accepted: 1. SPM1 has been comprehensively redrawn, the previous labelling (1 - 5) of the themes of the report have been removed. 2. In the redrawn figure land cover is now reflected in the simplified central illustration.
1669	4	1	4	12	Figure SPM1 should use adaptability instead of adaptation. Besides, the core issues of adaptation should include landscape, land use change, sustainable land use planning, prevention from soil erosion, biodiversity conservation, etc. [Chao WEI, China]	Noted. SPM1 has been comprehensively redrawn, the previous labelling of adaptation (and other themes of the report) have been removed.
14531	4	1	4	12	For figure SPM.1, the definition of #4, Land Degradation, is too narrow. It should include soil erosion or loss of soil organic matter. Definitions of mitigation, adaptation, desertification, land degradation and food security would be useful. [, Canada]	Noted. SPM1 has been comprehensively redrawn, the previous labelling (1 - 5) of the themes of the report have been removed.
23769	4	1	4	12	Terrestrial water sources and their management are most important part of sustainable development. Water is not mentioned in Fig 1. This needs to be incorporated. Water management is probably the most important aspect of LULC. [, India]	Noted. In the redrawn figure irrigation is now specifically mentioned in terms of land cover (main panel) and the volume of water used for irrigation is also shown as an indicator of land use intensification (panel c)
24655	4	1	4	12	Figure SPM1, the value and details included should be clear for the overall report [, Ireland]	Noted. SPM1 has been comprehensively redrawn, in the redrawn figure land cover data are shown as part of the central illustration, while several key indicators of the land system are now shown in panels B - E
4843	4	1	4	12	We would suggest making the Figure SPM 1. larger or simpler as some illustrations are too small. [, Japan]	Noted. SPM1 has been comprehensively redrawn. Specific illustrative icons were removed to simplify the figure.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
33829	4	1	4	12	Figure SPM 1: The figure contains a lot of information, and it is intuitively difficult to understand how the landscapes that represent the generalized climate and vegetation gradients, i.e. what the illustrations in each picture/square means. [, Norway]	Noted. The central visualisation of SPM1 has been simplified and now focuses on a single dimension - land cover. Ions have also been removed.
3873	4	1	4	12	Figure SPM 1 could be presented as a table or a 2-dimensionnal diagramme with on the x-axis the state of land (from left to right: pristine to degraded) and on the y-axis the latitude (from botom to top: tropics to boreal). In this table the policy responses could be introduced for each situation,; e.g. Degraded-(semi)Arid. This tabular representation would provide a very useful synopsis for policymakers of the policy measures. The figure caption should then be redrafted. [, Switzerland]	Noted. SPM1 has been comprehensively redrawn. To simplify the figure the 2-dimensional element of the central visualisation has been removed.
20667	4	1	4	12	It's not clear how the colour coding of the squares in this diagram relate to level of degradation. I understand that the browner squares are probably more degraded than the greener (due to the axis key) but I'm not sure what the lighter or darker colours allude to. [, United Kingdom (of Great Britain and Northern Ireland)]	Noted. The landscape visualisation has been completely redrawn and simplified. Degradation is no longer visualised in this way, but some indicators of degradation are shown instead.
20669	4	1	4	12	Aren't the points listed under desertification equally relevant for land degradation? [, United Kingdom (of Great Britain and Northern Ireland)]	Noted. SPM1 has been comprehensively redrawn, the previous labelling (1 - 5) of the themes of the report have been removed.
20671	4	1	4	12	It is not clear how the 'adaptation' land challenge relates to the diagram. If it applies to the whole diagram, than it would be helpful to explicitly state this in the figure footnote. If it related to a particular biome, than annoation would be helpful. [, United Kingdom (of Great Britain and Northern Ireland)]	Noted. SPM1 has been comprehensively redrawn, the previous labelling (1 - 5) of the themes of the report have been removed.
30907	4	1	4	12	Figure SPM1: Food production should be added under Food security. Under Adaptation add food production and productivity [, United Republic of Tanzania]	Noted. SPM1 has been comprehensively redrawn, the previous labelling (1 - 5) of the themes of the report have been removed.
4313	4	1	4	12	Fig1.1. The climate and vegetation could not be arranged in the same coordination [Guangsheng zhou, China]	Noted. SPM1 has been comprehensively redrawn. The matrix of climate and vegetation has been removed.
6103	4	1	4	12	It would be better to put this figure SPM1 in landscape position for better visibility [Jacques-Andre Ndione, Senegal]	Noted. However the figure has been redrawn now specifically for a landscape orientation.
29233	4	1	4	12	Figure SPM 1 has the potential to develop into a great and very useful figure. I suggest some minor modifications: 1) "Climate system" should apply for more than the sun, clouds and precip., and should therefore be moved in order to show that it also includes the atmosphere and land. (I wonder if it would be an idea to just indicate the ocean outside the land area without giving it much space). 2) It would be good if you could separate the mitigation part from the blue sky part. You may consider developing a simplified version of Fig 1.1 for the SPM (and you could use external experts as was done for the SR1.5 SPM). [Jan Fuglestedt, Norway]	Noted. SPM1 has been comprehensively redrawn. The figure has been simplified and the central illustration now does not reflect a two dimensional land scape but instead a visualisation of land cover. Therefore the visual for climate system and blue sky has been removed. The previous labelling (1 - 5) of the themes of the report have been also been removed.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
8789	4	1	4	12	<p>This is a useful Fig. that takes on an integrated approach to differentiate between transformation/SLM and desertification, thus providing a basis for integrating human-wellbeing (e.g. food security) in attempts to avoid, reduce or reverse land degradation /desertification. You may wish to include the following terms under the specific header so that the figure is better linked to the chapter contents and the other parts of the SPM:</p> <p>Point 2. Adaptation: Please include sustainable land management (SLM) besides sustainable forest management (SFM) (see chp. 4). Including SLM here would also better reflect components of the title of the SR in this Figure.</p> <p>Point 3. Desertification: Please include the aspect of 'secondary salinization' and 'nutrient depletion'. It would read: "Managing soil erosion, acidification, secondary salinization and nutrient depletion." (see chp. 3).</p> <p>Point 4. Land Degradation: What about sustainably managing pastures and forests? It would read Managing pollution, pastures, forests and invasive species. These are aspects that need to be addressed under land degradation as well and not only under point 5. on food security. In general: it would be very useful if Fig. SPM.1 reflects on the information on land use and land cover provided under A1.2 (p. 3, L12-17). [Jean-Luc Chotte, France]</p>	<p>Partially accepted:</p> <ol style="list-style-type: none"> 1. SPM1 has been comprehensively redrawn, the previous labelling (1 - 5) of the themes of the report have been removed. 2. The new version of SPM specifically focuses on land cover and land use change and intensity.
8871	4	1	4	12	<p>Figure SPM 1: Add the following under different options as follows: (definitions in SPI comments for Chap3 and Chap6)</p> <ol style="list-style-type: none"> 1. Mitigation: Soil carbon sequestration 2. Adaptation: Conservation agriculture 3. Desertification: Ecosystem carbon storage in soil and biomass 4. Land Degradation Controlling erosion 5. Food Security Urban agriculture [Jean-Luc Chotte, France] 	<p>Noted. SPM1 has been comprehensively redrawn, the previous labelling (1 - 5) of the themes of the report have been removed.</p>
11637	4	1	4	12	<p>Figure SPM1 the direction of the figure is clockwise, is there any significance of the way the graphs is presented. My comment is for clarity that is usually needed for out of the field reader. [Linah Ababneh, Sweden]</p>	<p>Noted. The visual of the figure has been thoroughly revised with text captions now included on the figure for each section to guide the reader.</p>
25247	4	1	4	12	<p>Terrestrial water sources and their management are most important part of sustainable development. Water is not mentioned in Fig 1. This needs to be incorporated. Water management is probably the most important aspect of LULC. [Naresh Kumar Soora, India]</p>	<p>Noted. In the redrawn figure irrigation is now specifically mentioned in terms of land cover (main panel) and the volume of water used for irrigation is also shown as an indicator of land use intensification (panel c)</p>

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
32567	4	1	4	12	In the Figure 1 titled 'Climate and land - challenges and land-climate system processes assessed in this report', term 'biodiversity' is absent. The figure refers to each land challenge (1. mitigation, 2. adaptation, 3. desertification, 4. land degradation and 5. food security) and examples are given of the types of response options that are most relevant to the land challenges. Based on research mentioned in chapters it is clear that biodiversity plays a critical role and is the underlying foundation of that provides solutions to each land challenge, especially for food security. Failure to mention biodiversity in the figure stands-out as a distinct oversight for the work presented in the report. Among other things the report draws attention biodiversity is critical to address the dynamics of CO2 fertilization, which has marked change in changing nutrition content for humans in edible plants (mentioned in Chapter 5), and makes several important references to the role of biodiversity in addressing land-climate challenges in other chapters. [Neeraja Havaligi, United States of America]	Noted. SPM1 has been comprehensively redrawn. The focus of the figure is also reframed to look at current land cover and historical trends for land use, food systems, intensification of land use, land degradation and desertification, GHG fluxes and climate change over land. The previous labelling (1 - 5) of the themes of the report have been removed. In light of this reframing biodiversity is not explicitly called out in the figure.
33087	4	1	4	12	What is the airplane doing here? I am a little afraid that by being too simple, this figure might be cherry-picking things and forgetting about others. [Philippe Marbaix, Belgium]	Noted. SPM1 has been comprehensively redrawn and icons removed from the much simplified central illustration.
22041	4	1	4	12	Figure SPM1-Please check: Can 'introduction of improved cultivar with potentially higher grain yield by research and development' be accommodated under (5) food security? [Suvadip Neogi, India]	Noted. SPM1 has been comprehensively redrawn, the previous labelling (1 - 5) of the themes of the report have been removed.
24489	4	1	4	20	Unclear why sequestration of carbon in soils is not listed as a mitigation measure? Bioenergy recycles carbon? Protection and enhancement of carbon stocks and sinks should be highlighted as a land based mitigation response rather than generic images of land use [, Ireland]	Noted. SPM1 has been comprehensively redrawn, the previous labelling (1 - 5) of the themes of the report have been removed.
2121	4	2	4	2	It is not clear why sustainable forest management and land tenure appear under adaptation, rather than mitigation. [David Kaimowitz, Nicaragua]	Noted. SPM1 has been comprehensively redrawn, the previous labelling (1 - 5) of the themes of the report have been removed.
2123	4	2	4	2	Avoided deforestation should also appear under mitigation [David Kaimowitz, Nicaragua]	Noted. SPM1 has been comprehensively redrawn, the previous labelling (1 - 5) of the themes of the report have been removed.
2125	4	2	4	2	The part of the figure that says GHG fluxes and energy exchange does not do justice to the multiple non-GHG pathways discussed in chapter 2, including different types of organic and inorganic aerosols, role of land use in cloud formation, changes in surface roughness, tipping points resulting from the interactions of multiple forcing mechanisms, and perhaps others. [David Kaimowitz, Nicaragua]	Noted. The redrawn (simplified) figure now includes a more expansive list of exchanges between the land and atmosphere including aerosols. However further information on the complex interactions highlighted in this comment are beyond the scope of this figure but are to be found in the TS and Ch2.
2969	4	2	4	2	It is a bit unclear from fig. SPM 1, how humans impact land degradation, desertification, and food security through changing climate, and how mitigation and adaptation can help reduce the outcomes.. [, Russian Federation]	Noted. To shown more clearly the effects of historic land use and intensity of land use on the land and climate system a series of indicative trends are now shown. The figure (in order to simplify) no longer focuses on mitigation and adaptation outcomes, but these are addressed in Figure SPM3.
3875	4	2	4	2	For the title of Figure SPM 1.: Would it not be more appropriate to write:"Climate and land - challenges ON land-climate systems processes assessed in this report". The rationale is that the challenges refer to the land-climate system processes. The conjunction AND does not establish such a link between challenges and land-climate processes. [, Switzerland]	Noted. The title has been reworded to: Land use and anthropogenic climate change. This is now more reflective of the redrawn figure, we note the framing of 'land challenges' used in the previous version of the figure have been removed.
24219	4	2	4	12	Figure SPM1 presents most of the ecosystems through the climate and vegetation gradient but looks missing the "desert ecosystem" which is different from the arid and semi-arid ecosystems. This may need to be reconsidered. [Kamal Djemouai, Algeria]	Noted. SPM1 has been completely redrawn. The central illustration now shows land cover but not ecosystem (the climatic gradient used in the previous version was removed for simplicity).

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
24767	4	2	4	12	For each land challenge, figure SPM 1 is supposed to list response options. This needs improvement with more precise options: 1. Mitigation - How is enhanced mineral weathering a response option? It is rather a challenge. 2. Adaptation - Add ENSURE to Land tenure & ownership, Dietary change in which direction? Less animal-based products?, Add REDUCE or ELIMINATE Food waste, 4. Desertification - How to manage soil erosion and acidification? Suggest to change to Ensure permanent plant cover and reduce tillage, 5. Food Security - Cropland, Livestock and grazing is managed, the figure should give a more precise indication of which options are more climate friendly, Deploy agroforestry, How should food transport and efficiency be adjusted?, [Viridiana Alcantara Cervantes, Germany]	Noted. SPM1 has been comprehensively redrawn, the previous labelling (1 - 5) of the themes of the report have been removed.
24769	4	2	4	12	What is the meaning of the flying airplane? [Viridiana Alcantara Cervantes, Germany]	Noted. SPM1 has been comprehensively redrawn and icons removed from the much simplified central illustration of land cover.
3877	4	3	4	4	Delete "is" ("Each segment shows a specific climatic zone that is supports different biomes [...].") [, Switzerland]	Noted. The figure caption has been re-written.
5297	4	3	4	4	Figure SPM 1, caption: Each segment shows a specific climatic zone that supports different biomes - Delete "is". [Klaus Radunsky, Austria]	Noted. The figure caption has been re-written.
25131	4	4	4	4	delete "is" [Alexander Erlewein, Germany]	Noted. The figure caption has been re-written.
31529	4	4	4	4	The word "is" should be removed from the frase "... specific climatic zone that is supports different biomes..." [, Brazil]	Noted. The figure caption has been re-written.
30037	4	4	4	4	delete the word "is" before "supports" [, Netherlands]	Noted. The figure caption has been re-written.
31793	4	4	4	4	remove "is" between "that" and "supports" [Samantha Grover, Australia]	Noted. The figure caption has been re-written.
6223	4	4	4	4	Delete the "is" between "that" and "supports different biomes" [Weimu Xu, Ireland]	Noted. The figure caption has been re-written.
2025	4	4	4	4	Remove "is". [William Lahoz, Norway]	Noted. The figure caption has been re-written.
31795	4	5	4	5	standardise format of (semi) arid: in the figure it is (semi) Arid while in the caption it is (semi)arid [Samantha Grover, Australia]	Noted. The figure caption has been re-written.
33443	4	6	4	6	No human intervention? Perhaps human interventions understood as direct interventions understood as active land management is meant here. But then that needs to be stated as such. Human influences, in particular indirect ones, have become relevant across the globe and there are no areas left really pristine. In some cases indirect human influences can also be understood as a "passive" kind of land management, e.g. protecting an area, demonstrating that there are relevant issues involved the authors need to consider and address more clearly. This is critically relevant in the context of the UNFCCC, where topics such LULUCF, AFOLU, and REDD+ are causing regularly headaches, exactly for these reasons that a tem such as "human intervention" is too vague tp be used without an additional clarifying text (or reference to the underlying report text where these issues are discussed, while making it clear what is meant here). [Andreas Fischlin, Switzerland]	Partially accepted. Figure SPM1 has been redrawn, the central illustration has been simplified and focuses now on land cover. However, human influence on the land system is now depicted in Panels A - E of the new figure where indicator trends are shown for land cover change, food systems, land use intensity, land degradation and desertification and GHG emissions.
31531	4	7	4	7	The text shall specify what kind of human pressures it is refering to. [, Brazil]	Noted. The figure caption has been re-written.
1679	4	7	4	8	FIG 1.1 : mitigation,adaptation,desertification,Land degradation,food security can not be listed In the fig, mitigation and adaptation are the approaches to address climate change , while desertification and land degradation are type of land productivities loss. [guosheng wang, China]	Noted. SPM1 has been comprehensively redrawn, the previous labelling (1 - 5) of the themes of the report have been removed, and the framing of 'land challenges' is no longer applied.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
27893	4	7	4	8	The concept of "land challenge" is very vague and does not clearly reflect the items outlined (i.e. mitigation, adaptation, desertification, degradation and food security). Desertification, degradation and food security are more challenges for land-based systems, which we can address through climate change mitigation and adaptation. When we look at the diagram the food security component contains elements, which are beyond the land. Also we need to explicitly indicate the interlinkages between the various components and elements indicated under mitigation, adaptation, desertification, degradation and food security in the diagram, because there are fine lines between where the sub-elements belong, for instance managing fire can be under mitigation/adapataion/land degradation/degradation. Therefore the interlinkages should be explicitly indicated. [Itchell Guiney, South Africa]	Noted. SPM1 has been comprehensively redrawn, and the framing of 'land challenges' is no longer applied.
8835	4	7	4	8	the mitigation measures for desertification are also key measures for addressing land degradation; include integrated land use planning as measures for land degradation and food security [Jean-Luc Chotte, France]	Noted. SPM1 has been comprehensively redrawn, the previous labelling (1 - 5) of the themes of the report have been removed.
31533	4	8	4	8	The text shall specify what are the response options it is referring to. [, Brazil]	Noted. The figure caption has been re-written.
31535	4	8	4	8	The text shall specify which land challenge it is referring to. [, Brazil]	Noted. The figure caption has been re-written.
31537	4	10	4	10	Notation for nitrogen dioxide should be corrected. There is an zero "0" and not an "O" representing the oxigen. [, Brazil]	Noted. The figure caption has been re-written.
4845	4	10	4	10	N2O's "O" looks like 0 (zero), but it is supposed to be O and needs to be corrected. [, Japan]	Noted. The figure caption has been re-written.
30039	4	10	4	10	Change N20 to N2O (i.e. the zero should be a character O) [, Netherlands]	Noted. The figure caption has been re-written.
38209	4	10	4	10	N20 should be N2O ("O" not zero). [, United States of America]	Noted. The figure caption has been re-written.
7695	4	10	4	10	N20 --> N2O; '0' is used instead of 'O'. There is the same mistake in the figure itself. There may be two boxes which are not properly indicated in the figure near cattle in Tropics/Sustainable area and a man in Temperate/Degraded area. [Hiroaki Kondo, Japan]	Noted. The figure caption has been re-written.
2027	4	10	4	10	N2O (0 replaced by letter O). [William Lahoz, Norway]	Noted. The figure caption has been re-written.
33445	4	11	4	11	why leaving out "surface roughness"? [Andreas Fischlin, Switzerland]	Rejected. In the revised figure SPM1 the central visualisation has been simplified (based on other comments) and therefore depicting surface roughness is beyond the scope of the figure.
2127	4	11	4	12	This qualifying sentence is not sufficient to address the previous mentioned concern. [David Kaimowitz, Nicaragua]	Noted. The figure caption has been re-written.
12527	4	21	4	22	Given the mitigation estimates in Ch. 2 Table ES2.1 on page 2-6, why not include natural forest protection in addition to Reforestation/Afforestation as it is a current function CD-R option as well as Reduced Deforestation option? This risks encouraging companies and governments substituting natural forest for planted forest. In addition other lines in Ch2 bear this out eg on page 2-7 lines 3 to 4, and line 22 [Davies Penny, United States of America]	This comment does not refer to Figure SPM1 (page 4) therefore we must assume there is an error in the page/line number assignment.
18141	4		4		Why is conservation of ecosystems and biodiversity not mentioned? [Astrid Schulz, Germany]	Noted. The figure has been redrawn and the corresponding caption rewritten. Conservation of ecosystems and biodiversity are not shown in the revised figure as this is not within the scope. However response options (including conservation) is covered in the new SPM3.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
15171	4		4		The figure is deeply confusing, primarily because there is no self-evident relationship between the numbered land challenges and the visual schamitic, and secondarily because the use of the term "sustainable" is incorrect, and erroneously suggests a continuum between degraded, "sustainable," and natural landscapes; "well-managed" might be a reasonable alternative. [Daniel Zarin, United States of America]	Partially accepted. SPM1 has been comprehensively redrawn, the previous labelling (1 - 5) of the themes of the report have been removed, and the framing of 'land challenges' is no longer applied. The central visualisation now longer depicts a matrix of degradation/desertification and biome and instead is simplified to focus only on land cover.
24389	4		4		This figure is too complex or not enough for such a report. It looks like an illustration of the table of content of the report and some of the symbols are not auto explicit. The part on the greenhouse gas fluxes might be useful but it would need to be a standalone figure with an explanation (currently the messages are too diluted in the figure and lack explanation). If this cannot be done, we suggest to delete the figure. [, Belgium]	Partially accepted. SPM1 has been comprehensively redrawn, the previous use of icons is not retained and the framing of 'land challenges' is no longer applied. The central visualisation now longer depicts a matrix of degradation/desertification and biome and instead is simplified to focus only on land cover. However in response to several comments more quantitative data is now included in the figure Panel A - F.
29821	4		4		Figure SPM1: Some of the options listed under specific categories can also correspond to others. For example, in SR1.5, afforestation and reforestation (avoided deforestation and ecosystem restoration) was assessed as both mitigation and adaptation options. The same happens with other options in this figure. [Ley Deborá, Guatemala]	Noted. SPM1 has been comprehensively redrawn, the previous labelling (1 - 5) of the themes of the report have been removed.
40371	4		4		The figure fails to convey the sense of the intersection with a changing climate and fails to represent the diverse climate components (atmosphere, ocean, biosphere, cryosphere) which interact with land surface. Aspects linked with aerosols and water are missing. I urge authors to consider figures which express the outcome of an assessment (not a framing) in the SPM, and report the level of scientific understanding / confidence / relative importance in the figure. [Valerie Masson-Delmotte, France]	Accepted. SPM1 has been comprehensively redrawn and now includes a set of indicator trends representing land use change, food system change, land use intensification, trends in desertification and degradation, GHG fluxes and climate change (temperature) over land.
27715	4	0			One aspect missing from Figure SPM 1 is the emissions of other species in additions to GHGs from tropical vegetation in particular. Biogenic volatile organic compounds (BVOCs) are important for atmospheric chemistry and cloud formation in particular, through their contribution towards secondary organic aerosol formation (e.g. Capes et al. 2009, ACP, doi: 10.5194/acpd-9-2533-2009). Cloudiness and precipitation are again key factors for the net ecosystem carbon exchange (Muri et al, GRL 2015, doi: 10.1002/2015GL063363). Hence it would be useful to add this to figure SPM 1 for a more holistic picture. Some of these aspects are discussed in Chapter 2. [Helene Muri, Norway]	Partially accepted. SPM1 has been comprehensively redrawn and now includes aerosols in the visualisation. BVOC's have not been included as this is beyond the scope of this figure, but is addressed in Chapter 2. Section 2.5.3.
27541	4	1			Please refer to figure SPM.1 in the SPM's text. [, Germany]	Accepted. SPM1 is now explicitly referred to in the text: {A1.2, A1.3, A2.1, A2.2, A3.1, C1.}
6739	4	1			In Figure 1 under mitigation: use the term "Renewable energy" instead of "Bioenergy". [tarig Ibrahim, Sudan]	Noted. SPM1 has been comprehensively redrawn, the previous labelling (1 - 5) of the themes of the report have been removed.
7431	4	1			In Figure 1 under Adaptation: use the term "Resoration of natural resources" instead of "Sustainable forest management". [tarig Ibrahim, Sudan]	Noted. SPM1 has been comprehensively redrawn, the previous labelling (1 - 5) of the themes of the report have been removed.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
25855	4	2			We believe that this figure is relevant and justified, but we consider that it is currently subject to several defects that must be corrected. In particular: - We believe that indicating activities in sub-bullets is confusing and contradicts several of the report's findings. It is not always clear how activities are divided into the different challenges. The examples of activities given under each theme are mainly cross-cutting activities and should be also mentioned under other themes. In particular, some activities such as sustainable forest management, agroforestry (which should be complemented by other agro-ecological practices) are relevant to mitigation, but also to other land and climate challenges, including adaptation, land degradation and food security, as clearly shown by the figures on page SPM-15, as well as Chapters 2, 4 and 6. Similarly, dietary change also contributes to mitigation and food security, perhaps more than to adaptation. We suggest to remove the activities indicated in the sub-bullets (which would lighten the figure), or if it is not possible, to use a new kind of presentation in order to be more consistent with the findings of Figure SPM-15 and Chapters 2, 4 and 6, for example by using a cross table "activity versus land-climate challenges". - In the "climate system" part of the figure, we suggest adding a 3rd column "water exchange" in addition to "greenhouse gas fluxes" and "energy exchange". This "water exchanges" column would contain two elements: evapotranspiration and precipitation. Therefore, in the column "energy exchange", we suggest to delete "evapotranspiration" and to add "latent energy". - We suggest to greatly simplify the figure, and to be rigorous in the elaboration of a legend. The colours and small figurative elements remain unexplained and their positioning on the different categories and status of land is not rigorous. This is the case, for example, for mountains, cars, garbage cans, etc. Similarly, we're surprised that the colour used for semi-arid soils is not yellow. - In the caption, biogeophysical should be replaced by biophysical in order to be consistent with the rest of the report. - We ask to remove the aircraft: it has nothing to do with the purpose of this figure. [, France]	Partially accepted. SPM1 has been comprehensively redrawn and simplified. The previous labelling (1 - 5) of the themes of the report have been removed. The central visualisation of SPM1 has been simplified and now focuses on a single dimension - land cover.
4213	4	2			Reword caption - what are "climate and land challenges"? [Ralph Sims, New Zealand]	Noted. SPM1 has been comprehensively redrawn, the previous labelling (1 - 5) of the themes of the report have been removed.
32241	4	4			Delete "is" in the sentence "Each segment shows a specific climatic zone that is supports different biomes (ecosystem types)," [Carmela Cascone, Italy]	Noted. The figure caption has been re-written.
4215	4	4			Delete "is" [Ralph Sims, New Zealand]	Noted. The figure caption has been re-written.
23293	4	10			Fix the symbol for 'O' in N2O (it is currently zero) [Mark Howden, Australia]	Noted. The figure caption has been re-written.
41671	4	10			N2O should have an 'Oh' not a zero [Michael Prather, United States of America]	Noted. The figure caption has been re-written.
16401	4	11			N2O-->N2O [, Republic of Korea]	Noted. The figure caption has been re-written.
41673	4	11			must add 'radiative' to biogeophysical, since the latter would not normally in WGI land include radiative. [Michael Prather, United States of America]	Noted. However the figure has been redrawn and the corresponding caption rewritten.
32903	4				better examples under mitigation are natural solutions such as those found in Dooley et al (2018). Bioenergy is not a carbon neutral and therefore cannot be considered mitigation. Enhanced mineral weathering is a speculative technology. Best to list technologies here that are proven and currently in use, ie., MOST relevant to that land challenge. under adaptation -- dietary change and food waste are both mitigation options, not adaptation. They reduce emissions. Under land degradation or food security section add agroecology. Why is there a plane in the graphic? Remove this, along with the car. [Doreen Stabinsky, United States of America]	Partially accepted. SPM1 has been comprehensively redrawn, the previous labelling (1 - 5) of the themes of the report have been removed, and the framing of 'land challenges' is no longer applied. The central visualisation now longer depicts a matrix of degradation/desertification and biome and instead is simplified to focus only on land cover. Icons used in the previous version are no longer used.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
26219	4				Figure SPM 1: The interplay between the different challenges is referred to in the caption of the Figure but is not visible from the Figure itself [, Luxembourg]	Noted. SPM1 has been comprehensively redrawn, and the caption rewritten.
26221	4				Figure SPM 1: The interpretation of the different symbols on the Figure is not clear: What is the role of the single plane and the car? Why are farmers only present in the degraded state? Why is livestock only present in sustainable state? How to interpret the absence of a symbol? Is it not compatible? [, Luxembourg]	Partially accepted. SPM1 has been comprehensively redrawn and simplified. The central visualisation now longer depicts a matrix of degradation/desertification and biome and instead is simplified to focus only on land cover.
26223	4				Figure SPM1: N2O should be written with a major O not a 0 (zero) [, Luxembourg]	Noted. The figure caption has been re-written.
16403	4				2. Adaptation - Replace 'Sustainable forest management' into 'Sustainable land management' or 'Sustainable agriculture and forest management' in feature labels. [, Republic of Korea]	Noted. SPM1 has been comprehensively redrawn, the previous labelling (1 - 5) of the themes of the report have been removed.
16405	4				4. Land degradation - Add 'Managing soil erosion' or add 'Preventing soil erosion or land collapse'. [, Republic of Korea]	Noted. SPM1 has been comprehensively redrawn, the previous labelling (1 - 5) of the themes of the report have been removed.
16407	4				5. Food Security - Replace 'Agroforestry' into 'Sustaining Agriculture and agroforestry'. [, Republic of Korea]	Noted. SPM1 has been comprehensively redrawn, the previous labelling (1 - 5) of the themes of the report have been removed.
5293	4				Figure SPM 1 does not explicitly address the challenge of climate change. Thus it neglects the fact that according to NDCs the world is on track of 3-4 degrees global warming. It is suggested that the figure also reflects the assessment described in the executive summary of chapter 7, in particular: Delaying deep mitigation in the energy sector and shifting the burden of mitigation to the land sector (BECCS!) increases the risk of adverse effects and mitigation failure (very high confidence) as risks of land-based mitigation are currently underplayed in IA;M-based scenarios. Due to increasing human and climatic disturbances carbon uptake of ecosystems can become carbon emissions in the future. [Klaus Radunsky, Austria]	Noted. Figure SPM1 has been completely redrawn and (based on many other reviewer comments) the central visualisation has been simplified. The figure provides information on the current state of the land system and historical trends in key indicators in land use, land use intensity, GHG fluxes and climate change over land. However, risk, response options and policy implications are beyond the scope of this figure but now dealt with in SPM2, SPM3 and SPM4 respectively.
5295	4				Figure SPM 1, caption: N2O should be changed to N2O. [Klaus Radunsky, Austria]	Noted. The figure caption has been re-written.
41663	4				Fig SPM-1 has several problems: 1 the title does not read in English - not sure what land-challenges are [Michael Prather, United States of America]	Noted. The figure title has been re-written and the use of 'land challenges' as a framing device is no longer used.
41665	4				Atmospheric chemical sinks for the GHGases (non-CO2) are needed here, they are impacted by the land also. [Michael Prather, United States of America]	Noted. However the central visualisation depicting GHG fluxes has been simplified (based on many other comments) and therefore complex interactions are beyond the scope of the visual.
41667	4				The Methane arrow pointing downward should disappear. Yes, there are land sinks for methane, but we know so little and particularly about how land degradation might affect the sinks. We do know more about the sources. Note: the land sources are about 15x larger than the sink, lose it. [Michael Prather, United States of America]	Rejected. The arrows (further simplified in the updated figure) are supposed to be indicative of processes, not of quantities. We also note that while it is much smaller, there is a methane sink and therefore the bidirectional arrow seems justified in this case.
41669	4				Energy exchange in the figure should have one wiggly line for latent/sensible heat and a straight line from the sun on albedo and aerosol effects. [Michael Prather, United States of America]	Noted. However the central visualisation depicting energy exchange has been simplified and complex interactions are beyond the scope of the visual. But detail provided in Ch2.
17779	4				What message is intended to be conveyed through this Figure? It is interesting to have a list of all the challenges related to land in one figure, but this list would appear in a more straightforward way to the reader if it were put in a Table. Currently it is polluted by too many illustrations, the purpose thereof is not easily understandable. For example, do we really need illustrations that tropical trees have different shapes than others? Or why is there a dustbin on degraded temperate land? What does the colour code for the soil mean? [Quentin Lejeune, Germany]	Partially accepted. SPM1 has been comprehensively redrawn and simplified. The previous use of icons is not retained and the framing of 'land challenges' is no longer applied. The central visualisation now longer depicts a matrix of degradation/desertification and biome and instead is simplified to focus only on land cover.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
17781	4				Should "Dietary change and food waste" not rather be included in the list of mitigation or food security challenges? This would also be more consistent with Page 16 [Quentin Lejeune, Germany]	Noted. SPM1 has been comprehensively redrawn, the previous labelling (1 - 5) of the themes of the report have been removed.
26067	4				Note to proofreaders: N2O ends in the letter O, not the number zero. [Reid Detchon, United States of America]	Noted.
14533	5	1	4	7	Figure SPM.2: Land use variables for Europe, North America and Oceania are averaged together and shown in one panel. This combination groups together three of the world's six continents in one panel covering very diverse land use. Recommend separating these continents into separate panels. [, Canada]	Figure SPM2 was removed from the SPM
14535	5	1	4	7	Figure SPM.2: The map shows 'used forests' (dark green) covering much of northern Canada and extending to the Arctic Ocean. Most of the forest in this region is unmanaged, and Ellis et al. (2010), which is cited as the source of this data in Chapter 1, shows most of Northern Canada covered by wild woodland (their figure 1, top panel). Recommend carefully checking the land cover data shown in the map against the sources used. [, Canada]	Figure SPM2 was removed from the SPM
14537	5	1	4	7	Figure SPM.2: In the panels, population, animal products, vegetable products and yields are shown separately as drivers of cropland change. Do the animal products and vegetable products changes refer to changes in the consumption of animal products and vegetable products per person? If not, then why does population appear as a driver? Suggest clarifying. [, Canada]	Figure SPM2 was removed from the SPM
22961	5	1	5	1	Figure SPM 2 is not readable. [Anastasios Kentarchos, Belgium]	Figure SPM2 was removed from the SPM
33979	5	1	5	1	Title of lower far right boxes are similar ('southern and eastern asia' and 'south-east asia'). Unclear what difference is. Is latter 'oceania'? [Cecile de Klein, New Zealand]	Figure SPM2 was removed from the SPM
3327	5	1	5	1	Cities or urban land could be added to this scheme [, Mexico]	Figure SPM2 was removed from the SPM
29967	5	1	5	1	Figure SPM2 would be improved by adding a line or dot indicating global/regional net change in cropland in addition to the drivers. [, Netherlands]	Figure SPM2 was removed from the SPM
38211	5	1	5	1	The legends and axis on the inserted figures were extremely difficult to read. [, United States of America]	Figure SPM2 was removed from the SPM
38213	5	1	5	1	Why is there no summary for South America? [, United States of America]	Figure SPM2 was removed from the SPM
7697	5	1	5	1	The meaning of right most graph in each inlay figure is unclear. Why only 'yield' is indicated in negative value with the unit of time variation of area? [Hiroaki Kondo, Japan]	Figure SPM2 was removed from the SPM
7699	5	1	5	1	The labels of the right most graph in the inlay figure of Southern and Eastern Asia is overlapped. [Hiroaki Kondo, Japan]	Figure SPM2 was removed from the SPM
8749	5	1	5	1	The 8 inlay figures for each region containing three graphs within each of those figures in SPM 2 is difficult to read and the key message isn't entirely clear. I would suggest simplifying the trend data within the inlays to arrows that differ in their widths as opposed to presenting the data in the figures. [Jean-Luc Chotte, France]	Figure SPM2 was removed from the SPM
24221	5	1	5	1	for the small box on "North Africa and West Asia", there maybe a need to use the common used wording "Middle East and North Africa - MENA". [Kamal Djemouai, Algeria]	Figure SPM2 was removed from the SPM

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
29735	5	1	5	1	As a policy-orientated reader, I found the overall map of land uses to be a useful piece of contextual information for the SPM – ie, the colour-coded world map. Also the land use extent and land use intensity graphics in the inlays provided useful contextual information. However, the third inlay, concerning 'drivers', seemed unnecessary and if anything, it confuses the reader, because it does not mention climate change as a driver here in this SPM about climate change! ie, I wondered what the point of including 'drivers of cropland change' was without incorporating climate drivers and I suggest it may be better to drop that set of charts. This is in line with my general observation of IPCC graphics (from which Figure SPM-1 also suffers, see comment above) that the authors try to cram too many pieces of information into a single graphic and therefore they dilute the power of their communication. Simplicity is effective. [Mairi Dupar, United Kingdom (of Great Britain and Northern Ireland)]	Figure SPM2 was removed from the SPM
31797	5	1	5	1	In the main map, one of the colours is for irrigated lands: this is man-made wetlands. I would suggest that wetlands should also be mapped, unless they are too small to show at this scale [Samantha Grover, Australia]	Figure SPM2 was removed from the SPM
14491	5	1	5	1	Fig.SPM2 well illustrates major issues in each region of the world: population, animal production and yields. Can we understand that "yield" means productivity up? In page 6 line26, productivity is used. Needs explanation.. [Shuzo Nishioka, Japan]	Figure SPM2 was removed from the SPM
4189	5	1	5	7	The resolution for the Figure SPM2 must be improved. Boxes showing trends are non legible. [Eugenia Gayo, Chile]	Figure SPM2 was removed from the SPM
24491	5	1	5	7	Very detailed but useful information in Figure SPM2 - perhaps combine image with a table with detail and provide projections if possible. Some of the changes in the histograms could be in a separate figure [, Ireland]	Figure SPM2 was removed from the SPM
4847	5	1	5	7	The letters in the Figure SPM 2. are too small. It's better to add the regional classification to the map. Also, in the panel of "Southern and Eastern Asia", the characters "population" and "yields" are overlaid. [, Japan]	Figure SPM2 was removed from the SPM
30343	5	1	5	7	Figure SPM 2: Map is very interesting to look at and deserves a larger display. Reconsider the colors and hues of the legend to better support the points you want to emphasise on the basis of this map. Also, it would be good to mention some of the points made in A1.2 and A1.3 in the subtext of the picture: % of agricultural land use, forestry, pristine land etc. Maybe make reference in the picture to climate change impacts to land use systems (although this might be too complex to figure) . [, Netherlands]	Figure SPM2 was removed from the SPM
30345	5	1	5	7	Figure SPM 2: Inlay figures are also very interesting. It might be worth considering splitting the figure into two and displaying all inlays under the map to give more space for a larger projection of the map and to arrange the inlays more logical (eg Europe and North America on top in the middle and North and West Africa below that. The balance of the land use change expressed for North and West Africa does not close: apparently cropland and forest area loss have to be explained by something else than increase of irrigated land. [, Netherlands]	Figure SPM2 was removed from the SPM
16409	5	1	5	7	The characters with Population and Yields. They are overlapped in Box at Southern Eastern Asia part. [, Republic of Korea]	Figure SPM2 was removed from the SPM
3879	5	1	5	7	Figure SPM 2. should be expanded on a whole page. This would allow to enlarge the map with the continents and allow to better see the subcontinental details, and to enlarge also the very informative 8 inlay figures. [, Switzerland]	Figure SPM2 was removed from the SPM

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
20673	5	1	5	7	It is unclear what key messages are being conveyed by this figure, given it is only referenced once in the SPM. The map in the centre is illustrative, but does not appear to link to the main body of text in any important way. The graphs contain more information, but have a number of other problems: 1) They are far too small, making it almost impossible to read without zooming in on a computer; 2) there is too much detail to take in here, making it suitable for the underlying report, but not for the Summary for Policy Makers 3) the differences in land use extent between 2000 and 2015 are minimal, so this could be removed to simplify the graphic; 4) the land use intensity graphic appears is misleading, as the differing units for forestry, livestock and cereals means that their magnitudes cannot be compared (which would otherwise be the main message to a non-expert); 5) using an absolute scale for drivers of cropland change is misleading without an indication of what percentage of total land this corresponds to. Overall, this figure needs to be simplified to get across specific key messages. [., United Kingdom (of Great Britain and Northern Ireland)]	Figure SPM2 was removed from the SPM
4315	5	1	5	7	Fig1.2 might divid the globe into different region in order to identify the responsible little figure. [Guangsheng zhou, China]	Figure SPM2 was removed from the SPM
6105	5	1	5	7	It would be better to put this figure SPM 2 in landscape position for better visibility [Jacques-Andre Ndione, Senegal]	Figure SPM2 was removed from the SPM
8791	5	1	5	7	Fig. SPM.2: The resolution of this figure needs to be improved. [Jean-Luc Chotte, France]	Figure SPM2 was removed from the SPM
33089	5	1	5	7	Figure SPM.2 - insets : - the two scales used in each middle panel should be explained (what are the units?) - as regard to the "driver" panels, what is the role of trade in agricultural products, including food for farm animals? What is the role of drivers other types, such as agricultural policy, urbanization or competition with other land uses? [Philippe Marbaix, Belgium]	Figure SPM2 was removed from the SPM
4849	5	2	5	7	It is not obvious for policy makers how each driver ("animal products" "vegetable products" "population", etc.) increase/decrease on cropland area: i.e., what is the "animal product" and why this driver can have positive/negative signs. We would suggest having more description of these terms and the way these drivers affect cropland area. [., Japan]	Figure SPM2 was removed from the SPM
3881	5	3	5	3	Write: "...land systems and includes also livestock systems ...". The rationale is that the current wording suggest that the figure represents only those land systems that have livestock. [., Switzerland]	Figure SPM2 was removed from the SPM
24391	5	3	5	6	How are trade and agricultural policies taken into account in the panel on drives of cropland change? If it is not taken into account, we think that those panels should be taken up in the SPM. [., Belgium]	Figure SPM2 was removed from the SPM
24393	5	3	5	6	The graph should be readable without reading the caption. We do not understand the units on the axis (even with the caption). [., Belgium]	Figure SPM2 was removed from the SPM
24395	5	3	5	6	The big map in the centre is nice but what is its purpose? We do not find it informative and suggest to delete it to save space. [., Belgium]	Figure SPM2 was removed from the SPM
24257	5	3	5	7	Why are data compared between 1994 and 2011 only? FAOSTAT is updated to 2016. [Francesco Tubiello, Italy]	Figure SPM2 was removed from the SPM
33841	5	3	5	7	Figure SPM 2: 15 years, 2000-2015, of land use extent were evaluated for three land land used, cropland, irrigated and forest area. What about other land uses? E.g. Urbanization has an influence on land uses. What is the relevance of mentioning "major drivers of the changes in cropland area for food production between 1941 and 2011", a 70 year period? Please consider the apropriateness of presenting this also for the 15 year period 2000-2015. [., Norway]	Figure SPM2 was removed from the SPM

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
20675	5	3	5	7	The 'drivers of cropland change' elements of the figure aren't clear. We have different tensions pulling in different directions. But are these saying, for example, that yield improvements have led to a reduction in land area or an increase/pressure? And, if so, populations are pulling the driver in a negative direction and having a positive influence on 'cropland change'? (meaning the assumption is that a positive influence is a negative thing). Overall: It's not very clear what is meant by this bar, straddling zero and going into both positive and negative territory. The small graphs showing change in 'land use intensity' would benefit from fuller label descriptions, drawing on the overall figure description. [United Kingdom (of Great Britain and Northern Ireland)]	Figure SPM2 was removed from the SPM
20677	5	3	5	7	There is a lot of information on this graph but it is hard to see what its key messages are - and with the various sections so small, it is also hard to read. Perhaps bigger focus should be given to the 'world' section? Drivers of cropland change figures are also unclear - it is hard to see what the colours mean on some of them and where the little lines are pointing to. Also regarding global 'forested area' - chapter 4 states that it has increased globally, whilst this suggest a decrease. Please could you clarify? (Arguably 'forested area' is also slightly ambiguous when put under 'land use extent' - presumably what is meant is that the total area of forest is reduced as opposed to the managed area is reduced but it isn't necessarily obvious unless you know how large is the forested area.) [United Kingdom (of Great Britain and Northern Ireland)]	Figure SPM2 was removed from the SPM
30023	5	4	5	4	change "with" in "and" [Netherlands]	Figure SPM2 was removed from the SPM
25133	5	5	5	5	put "all data" in bracket with source [Alexander Erlewein, Germany]	Figure SPM2 was removed from the SPM
31799	5	6	5	6	no comma required after "production" [Samantha Grover, Australia]	Figure SPM2 was removed from the SPM
15173	5		5		Within the inlay figures, I cannot tell which unit is belonging to which side of the land-use intensity graph (y-axes), nor can I make sense of the Drivers bar-chart. [Daniel Zarin, United States of America]	Figure SPM2 was removed from the SPM
29877	5		5		Figure SPM 2 is too difficult to read and has too much detail for a SPM. There should be references to it in SPM, but the figure itself should stay in the main report. [Estonia]	Figure SPM2 was removed from the SPM
29815	5		5		Figure 2 lacks clarity in the boxes of each region. [Ley Debora, Guatemala]	Figure SPM2 was removed from the SPM
11639	5		5		Figure SPM 2I would change the graph to make it central of the world and the regional graphs are close -- as much as possible- to the geographic area they represent. The way it is now, makes the reader wonder around looking for information. [Linah Ababneh, Sweden]	Figure SPM2 was removed from the SPM
40375	5		5		The map does not convey a sense of recent trends. What is the confidence / uncertainty / level of scientific understanding associated with the regional elements? What is the key message from this map and how could it be better represented with a simpler figure? [Valerie Masson-Delmotte, France]	Figure SPM2 was removed from the SPM
27717	5	0		7	It is difficult to see the difference between the "urban and mixed settlements" and Populated cropland, high livestock density" because of the colour scheme. The "urban and mixed settlements" should be a different colour. There is a mix between hectares and km ² as units in the legend. This is OK, if the conversion factor is included. But it does seem a bit untidy. [Helene Muri, Norway]	Figure SPM2 was removed from the SPM

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
27543	5	1			<p>Figure SPM.2 is intended to provide information on global land cover and trends with is very useful, but we suggest improving the figure to enable understanding by the target group of the SPM, i.e. non-experts.</p> <p>Comments on the map:</p> <ul style="list-style-type: none"> - The caption indicates that the map refers to "land systems with livestock systems", but the legend for the colour code lists land types without livestock. - It would be useful to indicate deserts - or are they indicated by grey areas called "wild barren land"? - The colours are too similar and in particular the greens cannot be distinguished. - Is the colouring indicating the land cover type based on the dominant type? - To which time period does this map refer? Is it consistent with the inlay figures? <p>Comments on the inlay figures:</p> <ul style="list-style-type: none"> - How do these three land categories compare to those shown on the map? Are they in any way covering the same area? - The grouping of regions does not seem to make sense, please explain and use consistent definitions of regions across the report. - Please explain the "drivers of cropland change". - Please use the same time periods for land-use intensity (currently 2000-2015) and for drivers (currently 1994-2011) or at least explain the impacts of using different periods. [, Germany] 	Figure SPM2 was removed from the SPM
4217	5	1			<p>Not clear why "3. Desertification" and "4. Land degradation" appear to be linked with the blue line to "Sustainable" and not to "Degraded". Better to have 2 lines from Degraded to each of 3 and 4. The way it is drawn, 5. also appears to relate only to the Tropics. Suggest lower section 5. so the two blue lines are more in a horizontal line with the "Sustainable" row of squares [Ralph Sims, New Zealand]</p>	Figure SPM2 was removed from the SPM

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
25857	5	2			We believe that this figure is relevant and justified, but we consider that it is currently subject to several defects that must be corrected. In particular: - The choice of the 2000-2015 period considered is too short to really assess the historical trend of land-climate challenges. We suggest using a longer period if possible, using for example the statistical data compiled by FAO since the 1960s. To be consistent with the other periods generally used in the IPCC reports: the trend should be considered, ideally from pre-industrial levels or by default, on the 2nd half of XXth century. - We suggest to add a dimension about international trade of food and fiber products, that is another driver of the trends, which can be major e.g. in Latin America for exports or in North Africa for imports. More generally, it is not clear how other factors are taking into account. In the case of indirect role, a sentence should be added to help the reader to understand which flows are behind the static figures. - We suggest that the unit of measurement used in the land use intensity figures be duly specified. The axes of this figure are not completely clear. The left axis works for the 2 first indicators (even if they use different measures : t/ha/year and m3/ha) ? When we look at the cereals indicator, corresponding to the right axis, do we have to consider "1" is the value for 2000, or would it be "3" ? - The consistency between the two identical figures Figure SPM-2 page SPM-5 and Figure 1.2 pages 1-12 to 1-13 should be enhanced, in particular in the use of the unit of measurement "t/ha/year" in the captions. - Generally, the clarity and the readability of this figure is still too low as too many details are wanted to be shown: the background world maps could be deleted (at least, the representative date of the data displayed should be specified), that could allow to increase the size of the boxes, more informative. This figure should be improved by harmonizing the colour code of land-use extent. [, France]	Figure SPM2 was removed from the SPM
16411	5	3			Title: ... with livestock systems? Please check the title of the figure. [, Republic of Korea]	Figure SPM2 was removed from the SPM
41675	5	3			I don't think you want to restruct it to 'livestock systems' in the first line. [Michael Prather, United States of America]	Figure SPM2 was removed from the SPM
4219	5	4			The unit "Mkm2 " has already been used above on page 3 - so delete "= 106km2)" [Ralph Sims, New Zealand]	Figure SPM2 was removed from the SPM
4221	5	5			Change "Livestock Unit" to "livestock unit" and delete "; all data". Figure legends listed as "Forests, Livestock, Cereals" so change to this same order in line 5 for consistency [Ralph Sims, New Zealand]	Figure SPM2 was removed from the SPM
38215	5	6			Remove comma after "production". [, United States of America]	Figure SPM2 was removed from the SPM
23755	5				Fig SPM2 Need to illustrate one box to make it simpler for policy makers to understand or interpret the boxes in the figure. Quite complex to understand even for economists especially what is sought to be conveyed about land use intensity and drivers of crop land change. Livestock units or density. Is this expressed in per ha of geographical area or in terms of net sown area or gross cropped area. [, India]	Figure SPM2 was removed from the SPM
5299	5				Figure SPM 2: It is noted that some changes are described for the period 2000 to 2015 whereas the change for cropland areas is for the period 1994 to 2011. However, the inlay figures do not reflect that difference in periods. It is suggested to provide in the final version the changes for the same period for all trends. [Klaus Radunsky, Austria]	Figure SPM2 was removed from the SPM
5301	5				Figure SPM 2: It is suggested to provide information for which year(s) the land cover is representative that is include in the figure. [Klaus Radunsky, Austria]	Figure SPM2 was removed from the SPM

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
2245	5				Is it possible to change the colour of "urban and mixed settlements" - I am finding it difficult to identify any of this category on the map perhaps because it is so similar to "populated cropland"? [Nina Hunter, South Africa]	Figure SPM2 was removed from the SPM
28701	5				Figure 2: It is apparent that the representation of figures on forest area combine both natural forest and industrial tree plantations in a single category. Differentiating between industrial tree plantations and forests is essential. Natural forests are far more biodiverse, and are not grown with the specific intention of harvesting repeatedly. It is highly misleading to combine the two. [Rachel Smolker, United States of America]	Figure SPM2 was removed from the SPM
4853	6	21	3	22	According to AR4 and AR5 (e.g. Figure SPM.2, Figure 5.2 in AR4 WG2; Figure 7-4 in AR5 WG2), yields of some cereals are expected to increase in the case that the temperature increases only by around 1°C. Is the statement "each degree Celsius of global mean temperature increase is projected to reduce global yields of (...)" consistent with the previous IPCC reports? [, Japan]	Noted. This statement does not exist anymore in the new SPM version. Numbers for changes in yields are not provided anymore
4855	6	21	3	22	Regarding "each degree Celsius of global mean temperature increase is projected to reduce global yields of wheat by 6%, rice yields by 3.2%, and maize by 7.4%", uncertainty ranges of the figures such as confidence intervals or standard errors seem better to be added. Given the non-linear nature of the temperature response, corresponding temperature ranges, within which global crop yields are projected to decrease by the rates mentioned above, would be informative. [, Japan]	Noted. This statement does not exist anymore in the new SPM version. Numbers for changes in yields are not provided anymore
29737	6	44	4	46	It seemed odd not to mention small island states here (as being especially vulnerable and at risk of irreversible losses and damages) as the IPCC has done in its 1.5C of Global Warming report. Did you deem them to be outside the remit of the land report? [Mairi Dupar, United Kingdom (of Great Britain and Northern Ireland)]	Rejected, we have reorganize the section away from the regional focus. This will be dealt with later in the SPM
31539	6	1	6	1	...stress. An important A major cause [, Brazil]	Thank you for your comment. Accepted - The Final draft of the SPM has been revised.
14541	6	1	6	1	Sentence should state: Land resources "in many regions" are already under stress. This is not the case everywhere. [, Canada]	Thank you for your comment. The final draft of the SPM revised this sentence. The updated version states explicitly that "Vulnerability to land degradation is particularly high in low-lying coastal areas, river deltas, and in permafrost areas (high confidence) with the majority of people affected living in poverty".
3883	6	1	6	1	Write: "Land resources such as soils, water, animals and plants are already under stress.". The rationale is that policymakers need clarity when "land resources" is mentioned. Placing these new words in the first line of section A.2 allows to better understand the paragraphs of this section. [, Switzerland]	Partially accepted - sentence revised to include resource exploitation: "The rate and geographic extent of global land and freshwater resource exploitation over recent decades is unprecedented in human history".
29879	6	1	6	3	animal-based food, feed, fibre, fuel and other ecosystem services ¹ - it is for sure the demand for all types food, feed, fibre, fuel and other ecosystem services (and not just animal-based) that affects land-use. Please delete the word 'animal-based' or give a comparison with other types of land use. [, Estonia]	Thank you for your comment. The Final draft of the SPM has been revised.
27545	6	1	6	3	The SRCCL clearly outlines that land management options are key for reducing the pressure on land, e.g. chapter 4. Therefore, unsustainable land management should please be mentioned as a cause for pressure on land in this paragraph. [, Germany]	Thank you for your comment. The Final draft of the SPM has been revised. A2.1 states explicitly factors that put more pressure on land.
15857	6	1	6	5	OK.To add somewhere in this section what is written in chapter 2 p20, 225, Line38 "There is much uncertainty in the ability of current vegetation and land surface models to adequatelycapture tree mortality and the response of forests to climate extremes like drought." [Caroline Vincke, Belgium]	Thank you for your comment. The A2 HS has been revised and uncertainty language adjusted accordingly.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
24493	6	1	6	5	Climate change is at the core of this Report and should be foremost in high-level statements: e.g. climate change is shifting land zones exacerbating etc., based on A2.2 [, Ireland]	Thank you for your comment. The Final draft of the SPM has been revised, reinforcing the emphasis on CC.
24661	6	1	6	5	Header text is obscured by the inclusion of too many factors. Perhaps break up [, Ireland]	Thank you for your comment. The Final draft of the SPM has been revised. We hope the A2 HS presents a clear message now.
2973	6	1	6	5	The formulation of A2 item gives an impression that climatic stress is something additional to other serious impacts that could exacerbate the situation, but is not considered as the primary problem. Is it really so? [, Russian Federation]	Thank you for your comment. A2 has been revised in the final draft of the SPM.
30909	6	1	6	5	The conclusion about a major cause of increasing pressure on land is population growth and changing consumption pattern may not be general and is not uniform. It is debatable, confidence statement need to be included. [, United Republic of Tanzania]	Thank you for your comment. Accepted - The Final draft of the SPM has been revised.
17363	6	1	6	5	UNCCD published a Global Land Outlook report last year where they explicitly listed as drivers of land degradation factors like mining and infrastructure for transport, energy and industry and urban sprawl. These factors are omitted in the summary for policy makers."... deforestation, wetland drainage, overgrazing, unsustainable land use practices, and the expansion of agricultural, industrial, and urban areas (i.e., land use change) continue to be the most significant proximate cause of land degradation. Many modern crop and livestock management practices lead directly to soil erosion/compaction, reduced water filtration/availability, and declining biodiversity, both above and below ground. Meanwhile, mining and infrastructure for transport, energy, and industry are increasingly enlarging their footprint in the landscape and impacting land resources at ever larger scales. Over the last one hundred years, the amount of land used for urban and peri-urban areas has doubled, and is expected to accelerate further over the next few decades. However, while still relatively small in scale – at approximately 5 per cent of the global land area – urban areas often cover some of the most fertile soils and productive lands." [Taehyun Park, Republic of Korea]	Thank you for your comment. The revised A2 stated explicitly that anthropogenic factors accelerate land degradation: "Socio-economic drivers of land-use change such as technological development, population growth and increasing per capita demand for multiple ecosystem can amplify existing environmental and societal challenges, including the conversion of natural ecosystems into managed land, degradation of land already managed, rapid urbanisation, air and freshwater pollution from the intensification of land management and lack of equitable access to land resources"
22963	6	1	6	10	Section A needs to make a greater effort to clarify the contribution of climate change to land stress as distinct from a general discussion of the various drivers. This is important given that SRCCL needs to add value compared to the insights of IPBES and UNCCD. Merely stating that there are various interacting drivers does not help much. Is it possible to make statements that are more detailed than those of A2 & A2.1? [Anastasios Kentarchos, Belgium]	Thank you for your comment. The Final draft of the SPM has been revised and more detailed have been provided about contributions of CC on land degradation.
20681	6	1	6	10	There is significant duplication between A2.1 and the headline statements of A2/3, such that it could be deleted in its entirety without losing any key messages. [, United Kingdom (of Great Britain and Northern Ireland)]	Thank you for your comment. The Final draft of the SPM has been revised and redundancy of text has been deleted.
24503	6	1	6	29	It would be better to have a separate statement on CO2 fertilisation and a separate confidence statement [, Ireland]	Thank you for your comment. The Final draft of the SPM has been revised. Comment accepted.
33843	6	1	6	29	Please consider to make a new paragraph under section A.2 in the SPM. How pollinators are affected by both climate change itself and human interventions through different land management practices are very policyrelevant information. In the underlying chapters information regarding this is available at least in section 4.9.5, 5.2.4.5 and 7.5.6.2. IPBES has published a report about this earlier, so additional relevant information might be available there. [, Norway]	Thank you for your comment. The Final draft of the SPM has been revised. Comment rejected. While pollinators are very relevant, this goes beyond the scope of the report.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
6789	6	1	6	30	"Climate change is an additional stress that exacerbates existing land degradation and desertification processes and threatens food security (high confidence). {1.2.2, 1.3.1, 4.3.1, 4.3.3} ". This conclusion is based on chapter 4 , 3 and 5. But Chapter 3 and 5 are not quoted in the end of the paragraph. Please cite Chapter 3 and 5. [Changke Wang, China]	Thank you for your comment. The sentence and its line of sight has been revised in the SPM final draft.
24397	6	1	6	30	We would like to add somewhere in section A2 the following information from chapter 2 p20, 225, Line38 : "There is much uncertainty in the ability of current vegetation and land surface models to adequately capture tree mortality and the response of forests to climate extremes like drought." [, Belgium]	Thank you for your comment. The A2 HS has been revised and uncertainty language adjusted accordingly.
40259	6	2	6	2	... and changing consumption patterns. Suggest to rephrase this since changing could be to reduce the consumption patterns and not only increase. [Thelma Krug, Brazil]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence deleted.
27547	6	2	6	3	..." including increasing demand for animal-based food, feed, fibre, fuel and other ecosystem services": you define food, feed, fibre production in agriculture as an "ecosystem service", although it can be seen as well as an output of human economic activities (which depend on and make use of ecosystem services). To declare all production of biomass as such to be an "ecosystem service" is a rather normative and controversial judgement, which is not substantial for the overall analysis. Proposal: change "and other ecosystem services" to "and land-based eco-system services". Rethink and be more precise what human activities and goods are, and what "ecosystem services". Please see also our general comment on ES on the Entire Report. [, Germany]	Thank you for your comment. The Final draft of the SPM has been revised. Comment accepted: "These area and rate changes together with the intensification of land management have led to the loss of biodiversity and ecosystem services and the acceleration of land degradation and desertification that increasingly affects the livelihoods of people."
27549	6	2	6	3	"demand for animal-based food, feed" - this appears to be double-counting, "feed" should please be deleted. [, Germany]	Thank you for your comment. The Final draft of the SPM has been revised.
2971	6	3	6	3	Is 'fuel' a part of ecosystem services? May be 'biofuel'? [, Russian Federation]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence deleted.
27895	6	3	6	3	Should be consistent throughout the report in using "ecosystem goods and services" and not only services. [Itchell Guiney, South Africa]	Thank you for your comment. The Final draft of the SPM has been revised and ecosystem services definition updated.
8761	6	3	6	3	the report lists only provisioning ecosystem services - but the factors listed also increase demand for regulating and supporting services, which are not given examples. I recommend elaborating briefly to clarify the trade off that is frequently made between these different categories of ecosystem service [Jean-Luc Chotte, France]	Thank you for your comment. The Final draft of the SPM has been revised and ecosystem services definition updated.
32669	6	3	6	3	The notion of "ecosystem services" as the only prism through which ecosystems need to be viewed has been criticized by IPBES. More recent frameworks, such as Nature's Contributions to People (NCP), used by IPBES, aim to better encompass the non-commercial ways that nature contributes to human quality of life. Both ecosystem services and NCP frameworks could be used, both in the SPM and in the report. [Jean-Pascal van Ypersele, Belgium]	Thank you for your comment. The Final draft of the SPM has been revised and ecosystem services definition updated.
24657	6	3	6	5	Demand for all food should be included here. How has this changed? [, Ireland]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence deleted.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
20683	6	3	6	5	The sentence that reads 'Climate change is an additional stress... and threatens food security' implies that climate change only exacerbates existing problems, as opposed to creating new ones. This is in contrast to, for example, the executive summary of Chapter 4, which states 'While climate change exacerbates many of the ongoing land degradation processes of managed ecosystems, it also introduced novel degradation pathways...' (p4-4, lines 44-45). This is an important point which should be reflected in the headline statement, which could read something like 'Climate change is an addition threat that exacerbates existing, and introduces novel, land degradation and desertification processes, and threatens food security'. [, United Kingdom (of Great Britain and Northern Ireland)]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence deleted.
7235	6	4	6	5	How about threats to the livelihoods of those dependent on land? [Debra Roberts, South Africa]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence deleted.
8837	6	5	6	5	"over exploitation" needs to be defined and included in glossary [Jean-Luc Chotte, France]	Thank you for your comment. The Final draft of the SPM has been revised. This sentence has been rewritten and clarified the expression "over exploitation".
33447	6	6	6	6	"over-exploitation" sounds awkward to me. Similarly "depletion of land resources". It is unclear what is meant here. Is meant that soils are depleted of their mineral or nutrient content by non-sustainable human extraction (harvest plus transport off the land) of biomass? Or is soil fertility decreasing due to losing carbon content (humus) to the air (e.g. tillage)? Or soil degradation due to soil compaction, overgrazing, pollution? And are all these form and many more I could list really well subsumed under a term such as "over-exploitation"? I doubt it. [Andreas Fischlin, Switzerland]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence totally rephrased.
4851	6	6	6	6	"Rapid" seems to be unnecessary in this sentence judging from the connotation of A2.1. [, Japan]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence deleted.
17533	6	6	6	6	Here, also climate forcing should be listed. [, Sweden]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence totally rephrased.
20685	6	6	6	6	Should say 'is causing' as opposed to 'causes' given it is happening now. Same applies for Ch1 exec summary line. [, United Kingdom (of Great Britain and Northern Ireland)]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence totally rephrased.
38217	6	6	6	6	The sentence is ambiguous as to whether humans are over-exploiting resources, or humans are being over-exploited. Please clarify. [, United States of America]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence totally rephrased.
22965	6	6	6	7	Please modify the sentence as follows: "Human over-exploitation causes rapid depletion of land resources, pollution, reducing soil organic carbon, crop yield, freshwater access, and biodiversity in many regions. [Anastasios Kentarchos, Belgium]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence totally rephrased.
7237	6	6	6	7	Is it possible to quantify each of these effects? Such information will communicate a more policy-relevant message. Also, are these effects not experienced globally? What is meant by stating that the effects are in many regions? Perhaps, consider rephrasing to state that the effects are global but with regional differences and add which regions are the most affected if you have that information in the underlying chapters. [Debra Roberts, South Africa]	Thank you for your comment. The Final draft of the SPM has been revised. Accepted comment. The effects have been specifically identified.
24495	6	6	6	10	A less normative statement is warranted based on data about the levels of degraded land types and changes over significant periods. Also worth including that areas of land have been used for food production for centuries and continue to be productive: data for this would be useful [, Ireland]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence totally rephrased. Figure SPM1 presents data on land use and productive agricultural areas.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
24497	6	6	6	10	This is quite a general statement and could be more specific: e.g. the opening section has already indicated the mitigation and adaptation point [, Ireland]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence totally rephrased.
30041	6	6	6	10	Statement A2.1 is rather vague. It would be good to mention some examples and/or refer to Figure SPM 1 that mentions several response options [, Netherlands]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence totally rephrased. SPM figure has been radically changed.
17783	6	6	6	10	The statement "land management decisions have the potential to contribute to climate change mitigation and adaptation" feels badly located in this section. It rather seems to relate to the head statement in A1. [Quentin Lejeune, Germany]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence totally rephrased.
30807	6	7	6	7	this is surely certain [Mike Morecroft, United Kingdom (of Great Britain and Northern Ireland)]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence totally rephrased.
31801	6	7	6	7	A more appropriate term would be "water availability" rather than the current 'water access' [Samantha Grover, Australia]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence totally rephrased.
33449	6	7	6	8	I doubt there are only negative interactions. In some areas CC can cause "greening" due to increased precipitation, where CC benefits some lands. Thus this sentence calls for a correction, where one would have to distinguish the cases where the statement is appropriate from the cases where it is not. This contradicts in my view this virtually certain language. I believe it is not tenable. [Andreas Fischlin, Switzerland]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence totally rephrased and uncertainly language revised accordingly.
30005	6	7	6	8	This sentence does not reflect the content of section 1.2.2, where it is correctly stated that climate change will negatively impact yields (i.e. resource depletion) in some regions due to droughts etc. whereas in other regions (notably cold regions) it will improve yields e.g. due to better growing conditions and due to improved water use efficiency related to higher CO2 levels. This diversity needs to be reflected. Also, the conclusion is in our opinion not virtually certain as there is a lot of discussion around climate impacts. Moreover, virtually certain implies a 'probabilistic assessment of some well defined outcome' (https://www.ipcc.ch/site/assets/uploads/2018/02/ar4-uncertaintyguidancenote-1.pdf) which cannot be found in the sections referred to. [, Netherlands]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence totally rephrased.
27897	6	7	6	8	refer to comment number 1. The concept of human land use is used throughout the report, which is confusing. [Itchell Guiney, South Africa]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence totally rephrased.
22967	6	8	6	8	Why is this statement expressed in terms of certainty while the rest of the paragraph uses confidence? As per IPCC language guidelines, certainty is more quantitative (a probability). The statements themselves seem very similar. [Anastasios Kentarchos, Belgium]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence totally rephrased and uncertainly language revised accordingly.
25035	6	8	6	8	Why virtually certain? Better to use 'could' if there is such a high uncertainty [Binaya Shivakoti, Japan]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence totally rephrased and uncertainly language revised accordingly.
30809	6	8	6	8	I'd say this was high confidence rather than virtually certain NB the interactions between land use and climate are many and varied and differ between locations [Mike Morecroft, United Kingdom (of Great Britain and Northern Ireland)]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence totally rephrased and uncertainly language revised accordingly.
6665	6	8	6	8	"At the same time, land management decisions have the potential to contribute to climate change mitigation and adaptation (high confidence)". Should not this be "land and natural resources" management. Consider, for example the case of resources competition between moist forests and minerals under the soil [Mochamad Indrawan, Indonesia]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence totally rephrased.
40261	6	8	6	8	suggest to include adequate before land management decisions [Thelma Krug, Brazil]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence totally rephrased.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
33451	6	8	6	9	Decisions rarely warrant change, you also need implementation. Delete "decisions" and perhaps write "changes in land management towards improved sustainability has the potential ..." or something similar. [Andreas Fischlin, Switzerland]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence totally rephrased.
7239	6	8	6	9	The underlying chapters speak extensively about sustainable land management not just any form of land management. [Debra Roberts, South Africa]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence totally rephrased.
13777	6	8	6	9	re: "land management decisions" - ADD: and wider policy decisions w impacts on land management (not all land management impacts stem from land management decisions, but e.g. happen as a consequence [intended or not] of e.g. economic development making land exploitation more/ less economically viable) [Rianne ten Veen, Netherlands]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence totally rephrased.
33013	6	8	6	9	re: "land management decisions" - ADD: and wider policy decisions w impacts on land management (not all land management impacts stem from land management decisions, but e.g. happen as a consequence [intended or not] of e.g. economic development making land exploitation more/ less economically viable); adverse side effects of other policies on land management [Rianne ten Veen, Netherlands]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence totally rephrased.
30811	6	9	6	9	virtually certain that land management decisions have the potentially to contribute to mitigation and adaptation [Mike Morecroft, United Kingdom (of Great Britain and Northern Ireland)]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence totally rephrased and uncertainly language revised accordingly.
6667	6	11	6	11	"Climate change is already causing regional land cover zones to shift beyond the range of historical ..." This (A.2.2.) is example of the report being to "sciency" for some of the policy makers. If there is no compelling evidence then perhaps keep it in the technical parts but not in SPM. The SPM as it is, 30 pages, may already be too long for some of the policy makers in some countries. IMHO, ten page might be better [Mochamad Indrawan, Indonesia]	Thank you for your comment. The Final draft of the SPM has been revised. We summarised the SPM message. We hope it is more clear and precise now.
33453	6	11	6	12	Can you really say so? Which zones? What climate variability do you have in mind? Ice age, I would agree, yet those shifts are typically slow and delayed and therefore beyond detectability within more recent CC. More recent climate variability such as MWP or little ice age, have AFAIK hardly led to detectable zone shifts (at least not at the biome levell). [Andreas Fischlin, Switzerland]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence totally rephrased.
3885	6	11	6	12	The sentence is not clear because the word "shift" does not clearly refer to what is shifting: are new plants and animals going out or arriving to these land cover zones? [, Switzerland]	Thank you for your comment. The Final draft of the SPM has been revised. I hope your point is made clear now.
7701	6	11	6	12	Font size is inconsistent. [Hiroaki Kondo, Japan]	Editorial. Noted and corrected.
33455	6	11	6	20	It becomes a bit clearer what the first sentence in this paragraph might mean. Yet, the arguments given in the para make it clear that the first sentence is basically wrong. While I would agree that disturbance regimes may have shifted or started to shift (insects, e.g. Western mountain pine beetle, or fire regimes etc.), this does not yet mean that the entire land cover zone has already shifted. It merely indicates that we have to expect such shifts, but only in the future. [Andreas Fischlin, Switzerland]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence totally rephrased.
1555	6	11	6	20	Humans are in danger here, and the UK government may obviously need to help those affected to migrate to more temperate climates to cope. [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	Thank you for your comment. The Final draft of the SPM has been revised. I hope your point is made clear now.
30437	6	11	6	20	The report would be much stronger with a clear and concise summary of historical impacts of anthropogenic climate change on land resources in the Summary for Policymakers. Unfortunately, Section A2 provides very little of this information. Instead it mainly reviews potential future risks. Please add a paragraph that summarizes impacts on land detected and attributed to anthropogenic climate change. [Gonzalez Patrick, United States of America]	Thank you for your comment. The Final draft of the SPM has been revised. The HS A1 and A2 present evidence of CC and antropogenic drivers.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
24499	6	11	6	20	Provide some quantification of the shift that has been observed to date and projected changes. Avoid "will" statements based on projections. A shortened, more quantified bullet on shifting climate and ecosystems would be more useful. Phenology can be used as a source [, Ireland]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence totally rephrased.
8839	6	11	6	20	Supporting message are observations that are currently on going and trend is increasing the message is presented as events occurring in the future. Its necessary to present the current dimension of the occurrences and show trend into the future [Jean-Luc Chotte, France]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence totally rephrased.
38219	6	12	6	12	"(medium evidence, high agreement)" is a different style of confidence statement than is used elsewhere in the document. [, United States of America]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence totally rephrased.
5303	6	12	6	12	It is suggested to use the singular: As global mean temperature increases, tropical [Klaus Radunsky, Austria]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence totally rephrased.
40263	6	12	6	12	include SURFACE in global mean SURFACE temperature to be consistent with A.1.1 [Thelma Krug, Brazil]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence totally rephrased.
25859	6	12	6	14	Is it « hot climate zones » or « arid » ones ? [, France]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence totally rephrased.
6329	6	12	6	14	Can quantitative information be added here? This is a very general statement about "as global mean temperatures increase..." , but it would be helpful to understand what different levels of warming mean (e.g. 1.5, 2...) [, Gambia]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence totally rephrased.
30701	6	12	6	14	Provide likely temperature threshold [, United Republic of Tanzania]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence totally rephrased.
17535	6	13	6	13	Unclear what "new hot climate zones" implies. Additional hot climate zones? Unprecedented hot climate zones? Shifts? [, Sweden]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence totally rephrased.
25037	6	13	6	14	Confidence/certainty level is missing and required? [Binaya Shivakoti, Japan]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence totally rephrased. We revised the uncertainty language statements accordingly.
31803	6	14	6	14	add a comma after "shift" [Samantha Grover, Australia]	Editorial. Noted. Sentence restructured.
26225	6	16	6	16	The acceleration of permafrost thawing is an important topic and would benefit from quantified figures. [, Luxembourg]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence completely rephrased.
29881	6	16	6	17	Add evidence/confidence/agreement levels. [, Estonia]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence totally rephrased. We revised the uncertainty language statements accordingly.
25861	6	16	6	17	Isn't this applicable to the other areas ? Could it be possible to have a general introduction of effects followed by areas specificities ? [, France]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence completely rephrased.
33845	6	16	6	19	These two sentences include important information on potential effects of climate change in high-latitude and Arctic areas. We would like these sentences to remain in the SPM, and encourage you to make similar geographic differences/nuances available in other paragraphs of the SPM where relevant. [, Norway]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence completely rephrased.
7485	6	16	6	20	Note that permafrost thawing will release carbon (methane and carbon dioxide) that will further amplify warming, especially released methane because of its greater GWP. [Durwood Zaelke, United States of America]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence completely rephrased.
7571	6	16	6	20	Note that permafrost thawing will release carbon (methane and carbon dioxide) that will further amplify warming, especially released methane because of its greater GWP. [Kristin Campbell, United States of America]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence completely rephrased.
31805	6	18	6	18	add "the" before "treeline" [Samantha Grover, Australia]	Editorial. Noted.
7383	6	18	6	19	melting of snow and thawing of permafrost [Stephan Stephan Gruber, Canada]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence completely rephrased.
25863	6	19	6	19	"winter" to be replaced with "late winter" according to 2.6.3.1 line 10 and Figure 2.28 [, France]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence completely rephrased.

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31807	6	19	6	19	remove comma after "winter" [Samantha Grover, Australia]	Editorial. Noted.
40265	6	19	6	19	suggest to change ENHANCES to is projected to enhance... [Thelma Krug, Brazil]	Noted. Editorial
20687	6	21	6	21	Climate change threatens to reduce the yield of crops...hasn't it already? Could this be expressed here? [, United Kingdom (of Great Britain and Northern Ireland)]	Noted. You are correct and this is now how the new set of bullets are framed
30911	6	21	6	21	Add the word "further" to read " to futher reduce" [, United Republic of Tanzania]	Text changed.
27551	6	21	6	22	This sentence gives the impression that impacts on crop yields will change linearly with temperature on a global scale, so that a +1°C change from today to a 2°C world would have the same effect as a change between 2.5 und 3.5 or 5 and 6°C GMT rise - which surely can't be the intention of the authors. Please revise this sentence in the SPM and the related parts of chapter 5. Please revise and add uncertainty ranges. [, Germany]	Noted. Figure removed.
30007	6	21	6	23	This sentence is originated from box 7.3 based on a meta-study from Zhao et al 2017. In box 7.3 it is stated "...may reduce..." instead of "...is projected to reduce..." which is a much weaker statement. But in fact it is better to refer to figure 5.5 and section 5.2.3.1 that discuss the results of Zhao 2017 in more detail, including uncertainty ranges. Also, it should be stated these results do not take CO2-effects, adaptation and genetic improvement into account. We suggest to rephrase the sentence as follows: ". For example, one meta-study shows that each degree Celsius of global mean temperature increase may reduce global yields of wheat by 6.0 +/- 2.9%, rice yields by 3.2 +/- 3.7%, maize by 7.4 +/- 4.5%, not accounting for CO2-effects, adaptation and genetic improvement". [, Netherlands]	Noted. Figure removed.
26043	6	21	6	23	The original source (Zhao et al. 2017) of the numbers given in this section states: "Without CO2 fertilization, effective adaptation, and genetic improvement, each degree-Celsius increase in global mean temperature would, on average, reduce global yields of wheat by 6.0%, rice by 3.2%, maize by 7.4%, and soybean by 3.1%." It is important that is be made clear that these stated temperature impacts do not include the effects of CO2 or adaptation. Furthermore, the extent to which effects could be mitigated through use of additional N is unclear. In addition, the relation between these numbers and those given, e.g., in the CH 5 ES table 5.1 which indicate ranges should be more transparent. [Haroon Kheshgi, United States of America]	Noted. Figure removed.
33457	6	21	6	24	Uncertainty assessment missing [Andreas Fischlin, Switzerland]	Uncertainty statements added.
14543	6	21	6	24	Please rephrase as this projection is only in the absence of any adaptation. [, Canada]	Noted. You are correct. However the bullet has been substantially revised and now only addresses historical changes in yields in response to past climate change
25865	6	21	6	24	It would be interesting to differentiate the effect of climate on yields from the effect of practices or genetic selection. Are the figures presented then an estimate of the combination of all these factors or just the effect of climate, with constant practice and genetics? [, France]	Noted. The bullet here addresses only the effect historical climate change had on production. The bullet has been entirely rewritten and is hopefully more clear
26023	6	21	6	24	We suggest to detail further the CO2 fertilisation effect, including through quantitative assessment and uncertainty analysis. See GENERAL COMMENT ON CO2 FERTILISATION EFFECT. [, France]	Accepted. CO2 fertilization effects in sections A3.3 (greening, water use efficiency), A6.4 (sinks), A6.4 (food quality)

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
27553	6	21	6	24	We understand from the second part of this sentence, that rising concentrations of CO2 will mostly decrease the nutritional content of crops. Does this statement also encompass the clear findings summarized in the ES of chapter 5 (page 4 line 30) as well as discussed in Subchapter 5.2.4.3? If that is the case, we encourage the authors to spell out the findings more specifically and in a more quantified manner as appropriate, and suggest to include references to the relevant passages in chapter 5. [, Germany]	Accepted. Text rewritten to be more explanatory (A6.4)
3887	6	21	6	24	Such a strong statement needs an uncertainty qualification. [, Switzerland]	Noted. Assessing the numbers is difficult so in the new SPM version, the statements have substantially changed and numbers have been removed
20691	6	21	6	24	There is no confidence indication against this first statement of fact. [, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. The bullet has been substantially revised and the confidence on the impacts historical climate change had on yields is now assessed
38221	6	21	6	24	The opening sentence in A2.3 needs one or more confidence statements. It should be divided into two sentences. Also, as it relies on a single study, it should state, "According to one study, each degree ... may reduce global yields" Additionally, the study referenced was based on experiments with current rice crops; as crops could be modified over time, it would be better to state that the fertilization effects "have been shown to impact the nutritional content of rice." Finally, it should cite Box 7.3 rather than Section 7.3. [, United States of America]	Confidence statements added.
38223	6	21	6	24	The first sentence of A2.3 incorrectly references {7.3} and needs a confidence statement. [, United States of America]	7.3 now referenced for A2.3 on socio-economic drivers; confidence levels added
18255	6	21	6	24	evidence/agreement/confidence? [Julia Nabel, Germany]	Accepted. The bullet has been substantially revised and the confidence on the impacts historical climate change had on yields is now assessed
13423	6	21	6	24	Same comment as above [Lourdes Tibig, Philippines]	Noted. Advances in crop genetics discussed in Chapter 5.
30813	6	21	6	24	these are very specific projections but how much confidence is there in them - I guess high confidence in the direction of travel but low confidence in the specific numbers. How to present this needs more thought [Mike Morecroft, United Kingdom (of Great Britain and Northern Ireland)]	Noted. Figure removed.
4225	6	21	6	24	Crop yields haven't decreased much in spite of the present 1 deg rise as have been offset by improved genetics etc. Could not this continue? Eg with G M Os? [Ralph Sims, New Zealand]	Noted. Advances in crop genetics discussed in Chapter 5.
22969	6	21	6	29	Why are these yield changes so precise? For the SPM it would be better to accompany them with ranges or a narrative description. Also, what kind of climate change scenario produces these yield changes? [Anastasios Kentarchos, Belgium]	Accepted. Projected yield changes deleted; observed impacts presented in A3.6; range of cereal prices given for RCP6.0 in A6.4.
1557	6	21	6	29	UK government humanitarian and logistics & relief aid might be prioritized to focus on the global South region. [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	Thank you for this interesting comment. However it is beyond the scope of the report.
24501	6	21	6	29	The AR5 quantified climate impacts on staple food production; an update of this work would be a useful starting point [, Ireland]	Accepted. Range of crop and economic impacts given in A6.4.
20689	6	21	6	29	CO2 fertilisation is a complex and contested issue and one that is of wider public interest (for example it is often cited by climate change sceptics as a reason not to act). Therefore it is very important that the report is clear on CO2 fertilisation. We have left a number of comments on this topic in subsequent chapters, however for the SPM it would be preferable to make a single clear statement on the issue. At the moment it is addressed in a number of places (A2.3, A6.3 and to some extent in A5.4). [, United Kingdom (of Great Britain and Northern Ireland)]	Rejected. CO2 fertilization effects in sections as relevant -A3.3 (greening, water use efficiency), A6.4 (sinks), A6.4 (food quality)

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20693	6	21	6	29	Please consider whether this could be strengthened to link a decline in food yields to increased likelihood of population shifts (from Global South to Global North?) - if there is evidence to support this. [, United Kingdom (of Great Britain and Northern Ireland)]	Rejected. Climate is only one of many factors in the complex influences related to shifts of populations.
38225	6	21	6	29	In a number of places, including in SPM A2.3, the authors give figures about declining agricultural yields resulting from climate change. In these cases it is essential to make clear whether the estimated declines are relative to current yields or relative to projected future levels. Are losses percents less than current levels or percents less than the increase otherwise expected in the absence of climate change? These two different possibilities have very different implications for the magnitude of the challenge they represent and the text needs to be very clear in the SPM and where these types of findings appear elsewhere in the entire report. [, United States of America]	Noted. Projected impacts on cereal prices and food quality now in A6.4
38227	6	21	6	29	What about the impact of biofuels? [, United States of America]	See SPM Fig. 2; mitigation through bioenergy deployment causes risks to food systems, terrestrial ecosystems, and water scarcity
921	6	21	6	29	The SRCCL rightly projects that human populations in global south are going to be most impacted by reduction in crop yields due to global warming. This widespread shortage of food has the potential of creating social strife across countries and regions in global south. To address this unpleasant situation, it is recommended to establish an 'International Food Bank' to meet this kind of exigency. The proposed bank will monitor the food security world-wide, and take actions to supplement food availability in affected areas. [Jagdish Kishwan, India]	Thank you for this interesting comment. However it is beyond scope of the report.
41679	6	21	6	29	This para seems too negative and not balanced. It is mostly bad, OK, but totally? Also, get rid of one of the "affected" in the last sentence. [Michael Prather, United States of America]	Accepted. Text changed.
22043	6	21	6	29	A2.3-Please check and kindly address: What kind of degradation pathways are mentioned? If possible, please demystify. CO2 fertilization effect has shown positive impact on crop growth and grain yield of staple crops (both C3 and C4) in some regions of the world if other environmental parameters remain okay. [Suvadip Neogi, India]	Accepted. CO2 fertilization effects in sections A3.3 (greening, water use efficiency), A6.4 (sinks), A6.4 (food quality)
26227	6	22	6	23	Are the figure of 6%, 3.2% and 7.4% robust for each degree of warming? i.e. between 1°C and 2°C but also from 4°C to 5°C? [, Luxembourg]	Noted. Figure removed.
8209	6	22	6	23	Could it be made clear wether this figure includes the effect of CO2-fertilisation. [Harold Leffertstra, Norway]	Noted. Figure removed.
8841	6	23	6	23	it is not clear what CO2 fertilization effects means -- needs to be defined [Jean-Luc Chotte, France]	Noted. CO2 fertilization effects described in A3.3
29883	6	23	6	24	What is the evidence here and what are the positive examples? Please expand and also add evidence/confidence levels. [, Estonia]	Noted. CO2 effects on nutritional quality and confidence level added (A6.4)
20695	6	23	6	24	"CO2 fertilisation effects on vegetation will impact the nutritional content of crops, mostly negatively" - what level of confidence? [, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Medium confidence statement added (A6.4)
38229	6	23	6	24	Could not locate the section that discusses this finding in the underlying report. Does this really warrant inclusion as a major conclusion? [, United States of America]	Sections now provided for all major statements.
20697	6	24	6	24	According to Ch5 p 4/30, protein content of plants is also affected negatively by higher CO2 cc. - could this be expressly stated along with micronutrient availability? [, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Protein now included (A6.4).
5305	6	24	6	24	It is suggested to use the singular and use the similar language as in A.2.2: Changes in land-climate interactions as global mean temperature increases also introduce novel degradation ... [Klaus Radunsky, Austria]	Accepted. Temperature now singular throughout SPM.
31809	6	24	6	24	There should be a confidence bracket at the end of this sentence, after {7.3} [Samantha Grover, Australia]	Brackets added.

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29885	6	24	6	25	It is not clear what is meant by this sentence. Please rephrase and add examples. [, Estonia]	Text changed.
27555	6	24	6	25	"Changes in land-climate interactions as temperatures increase also introduce novel degradation pathways in wild and semi-natural ecosystems (high confidence)." Please explain what kind of novel degradation will happen as in the ES of chapter 4, page 4, 5. Regarding the structure of this paragraph: Why are wild and semi-natural ecosystems mentioned in this paragraph about crop yields, land productivity? [, Germany]	Text changed.
7703	6	24	6	25	Font size is inconsistent. [Hiroaki Kondo, Japan]	Font size fixed.
30815	6	24	6	25	what's 'novel degradation pathway' - language is unclear [Mike Morecroft, United Kingdom (of Great Britain and Northern Ireland)]	Text changed.
24505	6	24	6	26	What are novel degradation pathways and why are they so certain? [, Ireland]	Accepted. Text changed.
33459	6	25	6	25	Delete "pathways" (I doubt they can be defined) [Andreas Fischlin, Switzerland]	Accepted. Text changed. Pathways used only for SSPs
6791	6	25	6	25	"Changes in land-climate interactions as simultaneous increase also introduced novel degradation pathways in wild and semi-natural ecosystems (high confidence)". This expression is inconsistent with the content in Chapter 4. There is no uncertainty language in Chapter 4 (page 17-20). Please add uncertainty language in chapter 4. [Changke Wang, China]	Text changed.
8843	6	25	6	25	replace wild with natural [Jean-Luc Chotte, France]	Text changed. Deleted 'wild'
22971	6	25	6	26	Qualify: in the short term productivity outcomes might be positive but in the long term, outcomes will be negative in high latitudes also. [Anastasios Kentarchos, Belgium]	Text changed.
33461	6	25	6	27	Not the offsetting in other areas is the main issue here. I would argue that increased primary productivity does not necessarily result in increased NEPP, let alone net biome productivity as shifts in disturbance regimes demonstrate in some northern regions (e.g. bark beetle infestations in Canada). Similar arguments can be made for other disturbances such as fire. Finally, soil evolution may take place on temporal scales that significantly may impede PP and prevent the realisation of the increased productivity potential. [Andreas Fischlin, Switzerland]	Thank you for your comment. The Final draft of the SPM revised. A2 HS have been redrafted. Disturbance of ecosystems have been revised accordingly to the updated in the SRCCL chapters.
2975	6	26	6	26	it should be 'on productivity'? [, Russian Federation]	Thank you for your comment. The Final draft of the SPM revised entirely the A section.
32245	6	27	6	28	Affected is repeated twice in the sentence "There is, however, high agreement that the majority of the affected human populations directly affected are located in the global South" [Carmela Cascone, Italy]	Noted. Sentence with 'global South' removed.
4857	6	27	6	28	It does not seem obvious what is meant by "the majority of the affected human populations directly affected are ..." Further clarification is requested. [, Japan]	Noted. Sentence with 'global South' removed.
3329	6	27	6	28	Change to "There is, however, high agreement that the majority of the directly affected human populations are located in the global South". [, Mexico]	Noted. Sentence with 'global South' removed.
16415	6	27	6	28	Please check the sentence. [, Republic of Korea]	Noted. Sentence with 'global South' removed.
17537	6	27	6	28	The finding would seem to be fairly obvious and may not be useful in the SPM. Also, the "high agreement", "medium evidence" and "high agreement" flags are difficult to reconcile. [, Sweden]	Noted. Sentence with 'global South' removed.
38231	6	27	6	28	Suggest describing the populations that are most vulnerable or affected in terms of variables examined in this report -- e.g., which crops are cultivated, dependence on subsistence agriculture, GDP per capita. [, United States of America]	Accepted. Vulnerability described as e.g., 'high in low-lying coastal areas,' etc. in Section A2.2

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23177	6	27	6	29	delete sentence: "There is, however, high agreement that the majority of the affected human populations directly affected are located in the global South (medium evidence, high agreement). {4.4.1, 4.4.2}" It is trivial, as all of humanity is or soon will be directly affected, and the majority of human population lives in the "global south". If the sentence is supposed to refer to vulnerability, then it should be reformulated accordingly and be made much more nuanced, as the "global north" is not immune. [Anastasios Kentarchos, Belgium]	Accepted. Sentence with 'global South' removed.
27557	6	27	6	29	The meaning of the last sentence of A2.3 is unclear. By what are these people affected? And why is the global south more affected, because of climate change itself, because of higher exposure or of higher vulnerability? Is the affection positive or negative? So far the sentence only implies absolute dimensions. Since the population of the global south is much higher than of the global north, it would be of interest to the policy makers, if the sentence could also state the relative relationship: Is the fraction of people affected higher for the global south or for the global north. Please revise the sentence accordingly. [, Germany]	Accepted. Sentence with 'global South' removed.
23771	6	27	6	29	Remove affected in the beginning of line 28. or revise sentence [, India]	Noted. Sentence revised.
24507	6	27	6	29	Need to clarify this statement, which may be out of place here [, Ireland]	Noted. Sentence revised.
8211	6	27	6	29	Change the sentence to «There is however high agreement that the majority of the directly negatively affected populations are located in the global South.» This to make clear that the impact is negative. [Harold Leffertstra, Norway]	Noted. Sentence with 'global South' removed.
13425	6	27	6	29	Revise the statement to reflect the confidence level. [Lourdes Tibig, Philippines]	Noted. Sentence with 'global South' removed.
25249	6	27	6	29	Remove affected in the beginning of line 28. or revise sentence [Naresh Kumar Soora, India]	Noted. Sentence revised.
15529	6	28	6	28	Remove first "affected" as redundant. Should read: "the majority of the human populations directly affected". [Annika Herbert, South Africa]	Noted. Sentence with 'global South' removed.
15311	6	28	6	28	Suggest using a different terminology for "global South", and also in the underlying text in the Chapter. [, Australia]	Noted. Sentence with 'global South' removed.
31541	6	28	6	28	the population located in the global South are the majority directly affected by climate change or more vulnerable to it? CC will be affecting all regions, in different ways. The conditions of each population, as well as their priorities and capacities, might imply that the effects are opportunities, or inconveniences that can be solved or have disastrous effects. [, Brazil]	Noted. Sentence with 'global South' removed.
14539	6	28	6	28	The term 'global South' is not defined here or in the glossary. Suggest adding a definition. Elsewhere in the report the phrase 'developing world' is used, which may be more easily understood, and not confused with the Southern Hemisphere by non-specialists. [, Canada]	Noted. Sentence with 'global South' removed.
2977	6	28	6	28	Should it be 'impacts on'? [, Russian Federation]	Reject. Impacts 'in' OK in some cases.
2979	6	28	6	28	global South' ? This new geographical concept should be explained. [, Russian Federation]	Noted. Sentence with 'global South' removed.
17737	6	28	6	28	Could remove "affected" before "human populations", as "affected" also follows after it. [, Sweden]	Noted. Sentence with 'global South' removed.

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3889	6	28	6	28	The use of the concept of "global South" is unclear because there is no definition of this concept in the current Glossary. The authors seem to privilege one of the possible definitions because they use the word "located", while other definitions (cf. e.g. https://globalsouthstudies.as.virginia.edu/what-is-global-south) include also in the "global South" the poor in rich countries. Please clarify this concept or refrain from using it (would be our preferred option). [., Switzerland]	Noted. Sentence with 'global South' removed.
38233	6	28	6	28	What is the definition of "Global South?" [., United States of America]	Noted. Sentence with 'global South' removed.
8793	6	28	6	28	Please rephrase the following sentence to make it sound more eloquent: "... that the majority of the affected human populations directly affected are ...". Proposal to replace the term "affected" the second time it is being used. [Jean-Luc Chotte, France]	Noted. Sentence with 'global South' removed.
26069	6	28	6	28	Delete the first use of the word "affected" [Reid Detchon, United States of America]	Noted. Sentence with 'global South' removed.
40267	6	28	6	28	delete the first AFFECTED so sentence reads as ... of the human populations directly affected [Thelma Krug, Brazil]	Noted. Sentence with 'global South' removed.
3891	6	31	6	31	Write: "... not only atmospheric concentrations ..." [., Switzerland]	Accepted, the entire sentence has been revised
33463	6	31	6	32	Why would one first of all expect that GHG conc. shape regional climates? E.g. CO2 is distributed well after only one year within each of the two hemispheres and is typically globally distributed after only two years, while regional to local conc. vary greatly. Thus global mean conc. of GHG are the only ones that determine the energy balance of the climate system and hereby the actual CC at all spatial scales. What that means for regional climates is complex, not only due to the interactions mentioned on line 33, but also because the relationship between global and regional climates is in general quite complex and influenced by many more phenomena than just the listed ones. All in all, please reformulate to accommodate these aspects better. [Andreas Fischlin, Switzerland]	Accepted, we have kept the central idea and expanded on this on sections A4 and A5, as per this and other comments.
25867	6	31	6	33	SLCP are not referred to in the underlying paragraphs. Please use short lived climate forcers or pollutants as defined in the glossary and not species. The SLCP/SLCF are mentioned several times (A.3 et D.1.5) in the SPM, but a clear message on them is lacking, we propose that IPCC add a specific box on the link between SLCP and agriculture, recalling for example that an important part of these emissions come from agriculture, and that ozone may diminish the photosynthetic capacity). [., France]	Accepted, we have kept the central idea and expanded on this on sections A4 and A5, as per other comments
11641	6	31	6	33	IPCC certainty language is missing [Linah Ababneh, Sweden]	Accepted
20703	6	31	6	35	This could be simplified as such: 'A3. Changes in regional climates are shaped not only by concentrations of greenhouse gases (GHGs) but by changes in local and regional land use and land cover; these changes may moderate or amplify climate change impacts at a regional scale. [., United Kingdom (of Great Britain and Northern Ireland)]	Rejected. In the revision we avoided the regional dimensions in this section.
2129	6	31	6	37	This is one of the main conclusions of this report. However, the subsequent sections don't really build on this conclusion and provide guidance for policymakers about the implications. [David Kaimowitz, Nicaragua]	Accepted, in the revised SPM, we have focused on ensuring that each main conclusion was better represented by the cross-chapter summary statements under that section.
1559	6	31	6	37	The new Brazilian government under Jair Bolsonaro could be encouraged by the UK government to sign up to the recent Paris climate change agreement & targets plus the Katowice rule book, to ensure that the Amazon region acts to combat GHG emissions there. If not, please see feedback in sections B1.-B5. below for an alternative strategy on this issue. [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	Thank you very much for your comment, which is very valued and supportive. International support is needed to pressure the current Brazilian government to reinforce the current environmental protection policy. However, the SRCCL SPM does not highlight specific countries and it is not meant to be policy prescriptive.

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7487	6	31	6	37	Emphasize the potential for cascading and compounding feedbacks, highlighting the feedbacks discussed in this report and the proximity to the tipping points of trigger some feedbacks. [Durwood Zaelke, United States of America]	Accepted, this has been dealt with more in section A6 and A7, but the biophysical compounding has been outlined here.
24399	6	31	6	37	This is an important paragraph, it is important to keep it. [, Belgium]	Accepted, we have kept the central idea and expanded on this on sections A4 and A5, as per other comments
24509	6	31	6	37	Unclear what message the headline statement is providing? A clearer statement that policy is needed if mitigation and adaptation potentials of the land sector are to be realised. [, Ireland]	Accepted, we have kept the central idea and expanded on this on sections A4 and A5, as per other comments
30225	6	31	6	37	In this section is lacking the possible phenomenon of regional cascading tipping points trickering the one after the other, of which many relate to land, land degradation and land use. This could mean that a 2 degree C climate change, through positive feedback processes of a series of land-based tipping points, would lead to a further temperature increase up to 6 degree C, outside the domain of human control; the so called Hot House Earth scenario. See Steffen et al 2018, Trajectories of the Earth System in the Anthropocene, PNAS. [, Netherlands]	Rejected. In the revision we avoided the regional dimensions in this section.
30351	6	31	6	37	A3. It is a bit confusing that conclusions on regional effects are combined with conclusions on a global level. Consider to focus on regional effects only in this subchapter [, Netherlands]	Accepted, we have kept the central idea and expanded on this on sections A4 and A5, as per other comments
2981	6	31	6	37	A3 item is to be consulted with the IPCC WG1 [, Russian Federation]	Noted
20699	6	31	6	37	The second sentence of A3, reading 'Changes in local land cover...at a regional scale' can be deleted as it doesn't say anything not already contained in the preceding sentence. [, United Kingdom (of Great Britain and Northern Ireland)]	Accepted
20701	6	31	6	37	changes in landuse affect GHG concentrations and also otherwise' This is not clear. [, United Kingdom (of Great Britain and Northern Ireland)]	Accepted
41681	6	31	6	37	This para is difficult and not quite exact. E.g., it is not the concentration of greenhouse gases locally, but rather the physical climate change that mixes with land use to drive land degradation. The exception being gCO2 fertilization and dO3 (a GHG) interaction with stomata. But these are not really discussed here. 'Short-lived chemical species' is an odd insert here, do you mean short-lived climate forcers or pollutants? This para simply does not begin to address GHG feedbacks. Aerosols need to be mentioned with regional climate change. And, regional changes in RF have global impact. All told, this needs a full makeover when you decide what you want to say. [Michael Prather, United States of America]	Accepted, we have kept the central idea and expanded on this on sections A4 and A5, as per this and other comments.
22045	6	31	6	37	A3-Please check: short-lived chemical species.....what are those species? Please mention. Kindly check and confirm: 'with land potentially acting as a source and/or sink for emissions' or 'with land potentially acting as a source and/or sink for GHGs' [Suvadip Neogi, India]	Accepted, the reference to short-lived chemical species has been deleted
29237	6	32	6	32	I suggest you add "and aerosols" after "GHGs" (even if SLFC is mentioned on line 33; since the perspective there is more specific to land use) [Jan Fuglestedt, Norway]	Rejected. With refocusing on global effects in this section, we will deal with aerosols elsewhere.
32671	6	32	6	32	Please add "also" after "but" [Jean-Pascal van Ypersele, Belgium]	Rejected, the headline has been completely reworked.
30913	6	32	6	33	Delete "as a result ofand biophysical interactions [, United Republic of Tanzania]	Accepted, we have kept the central idea and expanded on this on sections A4 and A5, as per this and other comments.
30227	6	33	6	33	Explain the meaning of short-lived chemical species. [, Netherlands]	Accepted, the reference to short-lived chemical species has been deleted
20705	6	33	6	33	"short-lived chemical species": do you mean aerosols here? If so, "chemical" doesn't seem to be quite right. Perhaps "short-lived pollutants in the atmosphere"? [, United Kingdom (of Great Britain and Northern Ireland)]	Accepted, the reference to short-lived chemical species has been deleted

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24225	6	33	6	33	There maybe a typo mistake: "chemical species".... To be replaced either by "climate pollutants" or "climate forcers" (SLCPs). [Kamal Djemouai, Algeria]	Accepted, the reference to short-lived chemical species has been deleted
31811	6	33	6	33	add the word "and" between "energy" and "shortlived", also replace the "and" before "biophysical interactions" with the words "as well as altered" [Samantha Grover, Australia]	Accepted, the reference to short-lived chemical species has been deleted
23295	6	34	6	34	Saying that local changes can have regional impacts could confuse policy-makers. They might be thinking changes on a hectare scale can have sub-continental impacts. Perhaps clarify the language to imply consistency of scale. [Mark Howden, Australia]	Accepted. In the revision we avoided the regional dimensions in this section.
40269	6	35	6	35	GHG = greenhouse gases (first tme it appears in the text) [Thelma Krug, Brazil]	Accepted
33465	6	35	6	37	Reads awkward that only feedback processes act to increase or decrease atmos. GHG conc. Then it is not only land that matters heere, ocenas need to be considered as well. Finally, "potentially" sound also awkward. Do you perhaps mean a net source and/or net sink? Land functions regularly as sink (e.g. during growing season) or source (e.g. outside growing season), effects that are essential for the aforementioned feedbacks and we would have no such feedbacks without such effects, typically altering all the time. Finally "land potentially acting as a source ... for emissions"? Confusing language! [Andreas Fischlin, Switzerland]	Accepted, the headline has been completely reworked to address this and other concerns
17539	6	36	6	36	"potentially" sounds odd here. (Land is either a sink or a source.) Suggest omitting the word. [, Sweden]	Accepted
31813	6	36	6	36	remove "potentially" after land, as land acting as a source and sink for emissions is a well established current fact, not a potential [Samantha Grover, Australia]	Accepted
27559	6	36	6	37	Please modify or delete the following sentence: "Multiple feedback processes act to increase or decrease atmospheric GHG concentrations at a global scale, with land potentially acting as a source and/or sink for emissions (see BOX SPM 1)". Currently it seems to say very little, other than there are feedback loops that can go in both directions. In its current form it is not so useful for policy making. [, Germany]	Accepted, the headline has been completely reworked to address this and other concerns
17365	6	38	6	38	The SPM should make reference here to either ecological integrity as an overarching term that includes biodiversity or should list biodiversity next to the ecosystem services that are more anthropocentric focused. [Taehyun Park, Republic of Korea]	Rejected. The paragraph ahs been deleted as suggested by another reviewer.
7241	6	38	6	40	An assessment of this bullet point is required. [Debra Roberts, South Africa]	Accepted
7705	6	38	6	40	Font size is inconsistent. [Hiroaki Kondo, Japan]	Accepted
25135	6	38	6	41	Meaning of para not very clear. What is meant by "multi food basket failures"? [Alexander Erlewein, Germany]	Accepted, the section has been fully revised and this is no longer a concerns
32247	6	38	6	41	In this view climate change topics could be also considered interlinked with issues of policy targeting different goals such as the Sendai framework, the Agenda 2030, the Biodiversity Convention [Carmela Cascone, Italy]	Rejected, this is beyond the scope of this report
29887	6	38	6	41	The two sentences in this para need confidence/evidence levels. [, Estonia]	Accepted, all paragraphs now have uncertainty language
24511	6	38	6	41	This needs to be clearer - what is multiple food basked referring to? [, Ireland]	Accepted, the section has been fully revised and this is no longer a concerns
781	6	38	6	41	this paragraph does not include any confidence level. Either it is added or the paragraph should be deleted. [, Spain]	Accepted, all paragraphs now have uncertainty language
38237	6	38	6	41	A3.1 lacks a confidence statement and is not supported by the referenced section of the underlying report. [, United States of America]	Accepted, all paragraphs now have uncertainty language
18257	6	38	6	41	evidence/agreement/confidence? [Julia Nabel, Germany]	Accepted
22047	6	38	6	41	A3.1-Please check: kindly provide confidence statement. [Suvadip Neogi, India]	Accepted

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17785	6	38	6	46	Again the paragraphs A3.1 and A3.2 seem oddly placed here. They relate to impacts of climate change on land systems, and therefore more to the content of Section A2 in my view. The head statement of A3, in contrast, suggests that this section is about the effects of LULC on climate and the role of land in the C cycle. [Quentin Lejeune, Germany]	Accepted, the section has been fully revised and this is no longer a concerns
26071	6	39	6	39	Delete the word "may" [Reid Detchon, United States of America]	Noted
13107	6	40	6	40	"multi food basket failures" Not clear. [David Cooper, Canada]	Accepted, the section has been fully revised and this term has been removed
4859	6	40	6	40	The phrase "Multi food basket failures" is hard to understand for non-specialists. Please consider revising it to facilitate easier understanding. [, Japan]	Accepted, the section has been fully revised and this term has been removed
30353	6	40	6	40	A3.1 Explain 'food basket failures' [, Netherlands]	Accepted, the section has been fully revised and this term has been removed
17541	6	40	6	40	Would "multiple breadbasket" be a clearer term than "multi food basket"? (Also, should reconcile this with the terminology used in 7.3.3.) [, Sweden]	Accepted, the section has been fully revised and this term has been removed
3893	6	40	6	40	What is it meant by "Multi food basket failure"? [, Switzerland]	Accepted, the section has been fully revised and this term has been removed
20707	6	40	6	40	not sure everyone will be clear on what 'multiple food basket failures' means. Please clarify. [, United Kingdom (of Great Britain and Northern Ireland)]	Accepted, the section has been fully revised and this term has been removed
38239	6	40	6	40	The term, "multi food basket failures" is confusing and needs clarification. [, United States of America]	Accepted, the section has been fully revised and this term has been removed
21709	6	40	6	40	the sentence starting "multi ..." is full of jargon, but its message is not clear. [Graham von Maltitz, South Africa]	Accepted, the section has been fully revised and this term has been removed
29239	6	40	6	40	I think "Multi food basked failures" will not be understood by most of the readers, and I suggest you explain. [Jan Fuglestvedt, Norway]	Accepted, the section has been fully revised and this term has been removed
8577	6	40	6	40	meaning of the sentence not clear [Marc Aubinet, Belgium]	Accepted, the section has been fully revised and this term has been removed
30817	6	40	6	40	What's a 'multi food basket failure' - need clarity what is meant [Mike Morecroft, United Kingdom (of Great Britain and Northern Ireland)]	Accepted, the section has been fully revised and this term has been removed
22973	6	40	6	41	The concept "multi food basket failures" is unclear. Please explain what does it mean in the SPM. [Anastasios Kentarchos, Belgium]	Accepted, the section has been fully revised and this term has been removed
14545	6	40	6	41	"Multi food basket failures provide an example of where cascading risks affect multiple systems and governance levels." It is unclear what a "multi food basket failure" is. Perhaps this could be clarified. [, Canada]	Accepted, the section has been fully revised and this term has been removed
29889	6	40	6	41	What is the meaning of this sentence? It sounds dramatic, but what exactly is meant here? What are the 'multi food basket failures'? [, Estonia]	Accepted, the section has been fully revised and this term has been removed
25869	6	40	6	41	The concept of « multi-food basket » is not clear for the wider public. It should be clarified. [, France]	Accepted, the section has been fully revised and this term has been removed
23773	6	40	6	41	Multi food basket failures.....In agriculture crop diversification and use of multiple species are one of the major components of adaptation to climate change. This sentence ...implied that multi food basket failures are more....It is not clear and pl make it more explicit as readers should not think that only a few crops/ varieties can solve the food security issues. [, India]	Accepted, the section has been fully revised and this term has been removed
24659	6	40	6	41	Text on multi-food basket is very obscure, even for expert readers. Clarify or delete [, Ireland]	Accepted, the section has been fully revised and this term has been removed
25251	6	40	6	41	Multi food basket failures.....In agriculture crop diversification and use of multiple species are one of the major components of adaptation to climate change. This sentence ...implied that multi food basket failures are more....It is not clear and pl make it more explicit as Governments should not think that only a few crops/ varieties can solve the food security issues. [Naresh Kumar Soora, India]	Accepted, the section has been fully revised and this term has been removed

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24513	6	42	6	42	Can tipping points be identified? E.g. Major loss of carbon from soils? And the level of warming at which these might occur would be helpful [, Ireland]	Accepted partially. The impacts of climate change on ecosystems has been regrouped in section A7 and we now present a more risk based assessment rather than a focus on tipping points.
2131	6	42	6	43	You should address the extent to which the interactions mentioned in A.3 increase the probability of reaching global or regional tipping points (e.g. the transformation of the Amazon rainforest to permanent savanna. [David Kaimowitz, Nicaragua]	Accepted partially. The impacts of climate change on ecosystems has been regrouped in section A7 and we now present a more risk based assessment rather than a focus on tipping points.
32249	6	42	6	46	Also consider the positive feedback of temperature increase exacerbating damages and accelerating changes and rate of ecosystem and biodiversity loss [Carmela Cascone, Italy]	Accepted partially. The impacts of climate change on ecosystems has been regrouped in section A7 and we now present a more risk based assessment rather than a focus on tipping points.
1561	6	42	6	46	The UK government might publicize & warn arctic & coastal communities about future damage to their eco-systems & helped to formulate action plans to mitigate them. [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	Noted
6331	6	42	6	46	Can anything be said here about where the tipping points lie? This would be highly relevant for policymakers [, Gambia]	Accepted partially. The impacts of climate change on ecosystems has been regrouped in section A7 and we now present a more risk based assessment rather than a focus on tipping points.
30055	6	42	6	46	It is not clear what tipping points are meant here. We would suggest to give some examples. [, Netherlands]	Accepted partially. The impacts of climate change on ecosystems has been regrouped in section A7 and we now present a more risk based assessment rather than a focus on tipping points.
33847	6	42	6	46	Please consider to lift the issue a little more forward. The scientific background from 1.5 degree report or from specific ecosystem, for example Amazon forest or boreal forest might be relevant to consider in this paragraph. [, Norway]	Accepted partially. The impacts of climate change on ecosystems has been regrouped in section A7 and we now present a more risk based assessment rather than a focus on tipping points.
30703	6	42	6	46	It will be more useful to provide quantitative assessment about the potential tipping point [, United Republic of Tanzania]	Accepted partially. The impacts of climate change on ecosystems has been regrouped in section A7 and we now present a more risk based assessment rather than a focus on tipping points.
38241	6	42	6	46	Odd that a discussion of tipping points would be stated with high or very high confidence when only hypothesized that they may exist. There is little quantitative evidence for the tipping points discussed. For example, what is the temperature needed to force mortality? [, United States of America]	Accepted partially. The impacts of climate change on ecosystems has been regrouped in section A7 and we now present a more risk based assessment rather than a focus on tipping points.
22049	6	42	6	46	A3.2-Please check: 'further loss of ecosystem services in terrestrial ecosystems'.....only terrestrial ecosystems? Unique coastal estuarine tidal mangrove ecosystems lie in the transition zone of of land and water interface; 'Arctic'.....only Arctic or Antarctic region also or better to write polar regions....Please address. [Suvadip Neogi, India]	Accepted partially. Coastal zone ecosystems have been addressed in the adaptation and mitigation response options sections. We now use the word polar rather than arctic.
29749	6	42	6	46	Coastal ecosystem tipping points have already been observed by Tseil-Waututh. It may be helpful for policy makers to revise this paragraph to acknowledge tipping points already witnessed. [Tanya Smith, Canada]	Accepted partially. The impacts of climate change on ecosystems has been regrouped in section A7 and we now present a more risk based assessment rather than a focus on tipping points.
7243	6	43	6	43	Consider changing to reference to SR1.5 to the section of the underlying chapter that informs this bullet. [Debra Roberts, South Africa]	Accepted partially. The impacts of climate change on ecosystems has been regrouped in section A7 and we now present a more risk based assessment rather than a focus on tipping points.
24401	6	43	6	44	Please list the tipping points explicitly. [, Belgium]	Accepted partially. The impacts of climate change on ecosystems has been regrouped in section A7 and we now present a more risk based assessment rather than a focus on tipping points.

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4861	6	43	6	44	Definitions for "tipping points" are necessary. If there is any definite tipping point around which risks discontinuously change, then showing its specific threshold of the changes. [, Japan]	Accepted partially. The impacts of climate change on ecosystems has been regrouped in section A7 and we now present a more risk based assessment rather than a focus on tipping points.
33467	6	43	6	45	<p>I challenge the very hgh confidence and the notion of tipping points as used here. For land these processes are rather gradual and therefore far from so clearcut as presented here. For what true tipping points are, consult the IPCC glossary and texts such as the appendix 1 to Lenton et al., 2008. In AR4 we identified particular tipping points (Fischlin et al., 2007), which were not clearly reassessed in AR5 (Settele et al., 2014). I suggest you consult these texts with respect to this topic to build on those findings and reformulate this text.</p> <p>Cited References: ----- Fischlin, A., Midgley, G.F., Price, J.T., Leemans, R., Gopal, B., Turley, C., Rounsevell, M.D.A., Dube, O.P., Tarazona, J. & Velichko, A.A., 2007. Ecosystems, their properties, goods and services. In: Parry, M.L., Canziani, O.F., Palutikof, J.P., van der Linden, P.J. & Hanson, C.E. (eds.). Climate change 2007: Impacts, adaptation and vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel of Climate Change (IPCC). Cambridge University Press, Cambridge, UK, vii, 973pp., 211-272. http://www.ipcc.ch/publications_and_data/ar4/wg2/en/ch4.html Fi103</p> <p>Lenton, T.M., Held, H., Kriegler, E., Hall, J.W., Lucht, W., Rahmstorf, S. & Schellnhuber, H.J., 2008. Tipping elements in the Earth's climate system. PNAS, 105(6): 1786-1793. doi: 10.1073/pnas.0705414105 Le182</p> <p>Settele, J., Scholes, R., Betts, R., Bunn, S., Leadley, P., Nepstad, D., Overpeck, J. & Taboada, M.A., 2014. Terrestrial and inland water systems. In: Field, C.B., Barros, V.R., Dokken, D.J., Mach, K.J., Mastrandrea, M.D., Bilir, T.E., Chatterjee, M., Ebi, K.L., Estrada, Y.O., Genova, R.C., Girma, B., Kissel, E.S., Levy, A.N., MacCracken, S., Mastrandrea, P.R. & White, L.L. (eds.). Climate change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC). Cambridge University Press, Cambridge, UK and New York, NY, USA, xvi, 1131pp., 271-359. doi: 10.1017/CBO9781107415379.009 Se102 [Andreas Fischlin, Switzerland]</p>	Accepted partially. The impacts of climate change on ecosystems has been regrouped in section A7 and we now present a more risk based assessment rather than a focus on tipping points.
14547	6	43	6	45	Need to include freshwater aquatic ecosystems as climate change and land degradation will have direct impacts on lakes, rivers and wetlands. [, Canada]	Accepted partially. Coastal zone ecosystems have been addressed in the adaptation and mitigation response options sections.
17367	6	44	6	44	The SPM should list biodiversity next to the ecosystem services as protecting biodiversity is key to maintain ecosystem services for humans. Only referring to ecosystem services has a very anthropocentric focus and neglects the human responsibility for the fate of biodiversity through their major impact on ecosystems and the biosphere overall. [Taehyun Park, Republic of Korea]	Accepted
3895	6	44	6	46	Could it be possible to include in the list "mountaneous ecosystems"? [, Switzerland]	Rejected, we have reorganize the section away from the regional focus. This will be dealt with later in the SPM
17543	6	45	6	45	Suggest adjusting "..., Arctic and coastal..." into "... including Arctic and coastal..." as these systems are among the most unique and threatened ones. [, Sweden]	Rejected, we have reorganize the section away from the regional focus. This will be dealt with later in the SPM

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33469	6	45	6	46	Refrain as much as possible from infringing on non-terrestrial aspects such as coastal ecosystems and leave that assessment to other IPCC reports (e.g. SROCC). [Andreas Fischlin, Switzerland]	Accepted
33471	6	47	6	47	Not only regional, but in some cases also global. [Andreas Fischlin, Switzerland]	Accepted
22975	6	47	6	48	The sentence "In agricultural areas irrigation moderates warming during the growing season" is right, but very often such irrigation leads to increased water stress and over-exploitation... which consequences also on CC and sustainability. This should be raised in the SPM. [Anastasios Kentarchos, Belgium]	Rejected. I am not sure how irrigation leads to increased water stress. We do note that irrigation accounts for 70% of global water use. I hope this addresses the concern.
12983	6	48	6	48	In agricultural areas irrigation moderates warming during the growing season'. I am not clear how irrigation moderates warming at the regional level, please mention the mechanism. [Aidan Farrell, Trinidad and Tobago]	Accepted, there is a revision in A5
22977	6	48	6	48	The sentence on irrigation should be deleted or balanced. Irrigation, at the system level, involves not only the supply of water to crops, but also the abstraction and transport of this water. Whilst the former often has the impacts mentioned, the latter often acts in the opposite direction. As most of the mentioned benefits of irrigation accrue in regions which otherwise have a scarcity of water, the sourcing of the water in such regions often means diversion from natural ecosystems, other legitimate uses (including irrigation elsewhere, like downstream countries) or the depletion of aquifers with potentially serious consequences in the future. [Anastasios Kentarchos, Belgium]	Accepted, a sentence has been added in Figure SPM 2
24515	6	48	6	48	Irrigation moderates warming? [Ireland]	Noted, it does.
31815	6	48	6	48	add a comma after "areas" [Samantha Grover, Australia]	Rejected, the sentence has been changed
20679	6	1	7	20	This section could be slightly reorganised for clarity such that A2 and its subsections could be specifically about the effect of climate on land, and A3 and its subsections could be specifically about the effect of land on climate (in its current form, there is significant overlap between the two). This would involve moving the sentences 'At the same time, land... mitigation and adaptation' (A2.1, lines 9-10) and 'In Arctic regions... during winter and spring.' (A2.2 lines 17-19) into A3 and its subsections. It would also involve moving the entirety of A3.2 underneath A2. A3.1 would be moved in its entirety to underneath A6, or to a new and separate section on risks from climate change. Also, the first sentence of A2.3 ('Climate change threatens to reduce... mostly negatively') could be moved into A5 as it relates to food security. It would also be important to highlight GHG fluxes, for which it could refer to box SPM1. [United Kingdom (of Great Britain and Northern Ireland)]	Thank you for your comment. The Final draft of the SPM has been revised. Comment partially accepted.
30365	6	1	7	47	A2/A4.5: Consider to add world map figures (like Figure SPM.2) with current land use compared to regional climate change impacts related to 1.5, 2 and e.g 3 degrees temperature rise (compare figure SPM 7 in AR5). [Netherlands]	Thank you for your comment. The Final draft of the SPM has been revised. Comment partially accepted. The SPM figures have been completed revised.
12533	6	31	7	20	Two very important points made in Ch 2 should be knocked home to decision makers and brought up front to SPM about the importance of biophysical interactions. Lines 14 to 16 on page 2-13 "Dense vegetation with high leaf index area (LIA), particularly forests, are prime regulators of the water cycle and heat transfer". There is high agreement on this. Secondly, from Ch 2, page 2-13 lines 27-28: "Photosynthetic CO2 uptake by forests has counteracted the CO2 increase by fossil fuel emission." This would give some better balance to the overall SPM [Davies Penny, United States of America]	Accepted, we have developed the second theme in section A4 and the first one in section A5, although we note that the effects of albedo are greater than those of evapotranspiration

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21973	6	38	7	45	I was wondering whether at this part, there should be a reference to the situation of global warming around 2 Degree Celsius. It could also be mentioned that the Paris Agreements sets forth a binding temperature target, however, this is framed as a range. Would it be possible to explain the scenario with reference to different warming events by 2020? [Petra Minnerop, United Kingdom (of Great Britain and Northern Ireland)]	Rejected. The section needs to represent the underlying report; it is not a stand alone document.
29891	6	47	7	1	Is this moderation sufficient to adapt to climate change? It sounds too optimistic. Please add something on limitations of irrigation and the adverse effects of it. [, Estonia]	Accepted, we have added bullets along these lines in section A4
1563	6	47	7	5	Plans to decrease de-forestation & better manage urbanisation may be helped by the UK government stepping up their efforts here. [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	Accepted, we have added bullets along these lines in section A4
27563	6	47	7	5	Please add numbers to support importance, i.e. max increase of temperature at UHI. [, Germany]	Accepted, we have added bullets along these lines in section A4
16417	6	47	7	5	The issues is very important. However, it is stand-alone, not linked with other parts enough. [, Republic of Korea]	Accepted, we have added bullets along these lines in section A4
4223	6	5			An example of how it affects adaptation would be useful. Also maybe mention soil carbon for mitigation. SPM audience won't know [Ralph Sims, New Zealand]	Thank you for your comment. The Final draft of the SPM has been revised. Adaptation strategies and enabling conditions are suggested in Sections C and D of the final draft.
7433	6	7			Use the term "erosion of biodiversity" instead of "biodiversity" [tarig Ibrahim, Sudan]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence totally rephrased.
41677	6	8			I think this is wrong. CC (climate change henceforth) will impovre the agricultuire in some places. That should be siad, but when averaged over the globe it is a net negative? Right?, but that integration isertainly not "certain". I think you meant that there are plavces where CC certainly degrade land resources. This hyperbole is bad for the report. In fact you say that in the next paragraph. [Michael Prather, United States of America]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence totally rephrased and uncertainly language revised accordingly.
2053	6	8			This is the only "virtually certain" of the SPM. This sentence sholud be highlighted maybe in bold letters or underlined [Tomas Molina, Spain]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence totally rephrased and uncertainly language revised accordingly.
2061	6	8			Virtually certain [Tomas Molina, Spain]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence totally rephrased and uncertainly language revised accordingly.
4227	6	15			Could add "habitability and food production" for clarity. [Ralph Sims, New Zealand]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence completely rephrased.
4229	6	18			"biomass crops grown for energy supply" maybe clearer for the lay person reader [Ralph Sims, New Zealand]	Thank you for your comment. The Final draft of the SPM has been revised. Sentence completely rephrased.
2075	6	19			Robust Evidence/high agreement [Tomas Molina, Spain]	Noted. Editorial
16413	6	21			There is no coincidence between description and reference. We couldn't find any data in land SR 7. 3. the changs of crops yields from past to present, and projection to the future should be needed in this SPM. But There are very differencies of yields projection data accoring to region, crops, and other factors. If it has to be expressed, it will be to be described more sensitively. Negative results is not everyting. [, Republic of Korea]	Accepted. Reference to 7.3 removed. Regional variations noted in A6.4.
15175	6	28			The sentence does not make clear that the effects are negative. [Daniel Zarin, United States of America]	Noted. Sentence with 'global South' removed.
38235	6	28			Remove first of two uses of the word "affected." [, United States of America]	Noted. Sentence with 'global South' removed.
4231	6	32			"sustainable land management that avoids degradation" [Ralph Sims, New Zealand]	Rejected, the proposed formulation is redundant
41683	6	38			A3.1 simply does not fall under A3 unles A3 focusses on feedbacks. [Michael Prather, United States of America]	Accepted, the section has been fully revised and is more internally consistent

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27561	6	40			Please explain "multi food basket failure". [, Germany]	Accepted, the section has been fully revised and this term has been removed
14493	6	40			Is "Multi food basket failures" appropriate expression of this type of risk? [Shuzo Nishioka, Japan]	Accepted, the section has been fully revised and this term has been removed
41685	6	42			In my IPCC experience, 'tipping points' are very trendy but never really well defined. A better choice might be "exceeding thresholds that irreversibly alter land cover and..." That is a better use if one sticks to the dictionary. [Michael Prather, United States of America]	Accepted partially. The impacts of climate change on ecosystems has been regrouped in section A7 and we now present a more risk based assessment rather than a focus on tipping points.
2067	6	45			Very high [Tomas Molina, Spain]	Noted, I am not sure I understand what is meant here.
32999	6	46			{1.2.2, 1.3.1,2,3,7, SR1.5} - Correction needed after 1.3.1 [Christopher Pereira, Canada]	Accepted
41687	6	47			This misses the global importance of RF changes: "...climate change and through changes in the radiative balance, alter global climate change." all the RF adds up. [Michael Prather, United States of America]	Accepted, we have added bullets along these lines in section A4
16419	6	48			Make BOX SPM about trends and projection of crops in the worlds. We consider yields trends with time series and projection will be very interested by policy makers. [, Republic of Korea]	Rejected, this is not supported by the underlying chapters
16421	6	48			Add 'such as rice paddy fields' between 'irrigation' and 'moderates'. [, Republic of Korea]	Rejected, the section has been revised
2077	6	48			Robust Evidence/high agreement [Tomas Molina, Spain]	Noted, I am not sure I understand what is meant here.
18319	6				"Changes in local land cover and land use can also moderate or amplify climate change impacts at a regional scale (medium confidence) {2.6}"(I33) followed by "Land use practices can amplify or moderate regional climate change (high confidence)." (I47). Why is the confidence level different in these two statements? [Edouard Davin, Switzerland]	Thank you for your comment. The Final draft of the SPM revised. Sentences have been rephrased and the confidence language statements revised accordingly.
15763	6				SPM A3: For prioritization, this section should be cited before section A2. [, Iran]	Thank you for your comment. The Final draft of the SPM revised entirely the A section.
15765	6				SPM A3: It is suggested that the deep ocean ecosystems topic should be added to this section. [, Iran]	Rejected. Beyond scope of SRCCL
31543	7	1	7	1	The document is presenting the concept that deforestation in tropical regions will enhance surface warming, which seems acceptable, but we cannot concur that only deforestation in tropical regions will cause such consequences. The reference to "TROPICAL REGIONS" should thus be removed, broadening the scope of the finding. Moreover, during winter removal of forest in tropical regions will cause the land surface temperature to decrease as is discussed in the second part of the paragraph. If there is no agreement to remove references to tropical and temperate, the paragraph as a whole should be removed. [, Brazil]	Accepted, we have made some major revisions to respond to this comment. Notably, we have provided more detail on the biogeochemical processes related to AFOLU in section A4 and the biophysical processes in section A5. We no longer single out tropical regions. We hope these changes adequately address the concerns.
2133	7	1	7	2	Important to mention potential teleconnections - regional climate changes in distant locations. [David Kaimowitz, Nicaragua]	Accepted partially. This idea has been integrated into section A5
13109	7	1	7	4	replace "enhance" by "increase" to avoid potential positive nuance [David Cooper, Canada]	Noted, the sentence has been modified and this is no longer a concern.
31817	7	2	7	2	add a comma after "latitudes" [Samantha Grover, Australia]	Rejected, this has been deleted
24403	7	2	7	3	This sentence about "cooling" can be confusing. It is thus important to add that "there is no agreement on whether land use change resulted in a discernible change of global mean annual surface air temperature (Ch2 Executive summary, P4L24)". In addition, cutting trees, in particular in boreal regions, could have a regional and seasonal cooling effect but still have a global warming effect due to CO2. [, Belgium]	Accepted, this has been deleted

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29893	7	2	7	3	Add confidence/evidence levels. We know from SR1.5 that warming in these areas has been more than the global average and the winters are increasingly with less snow. This sentence seems to suggest that the deforestation would help to cool these areas. There should be some caution here and mentioning the negative effects of deforestation. Also these kind of statements have to be linked/compared to the impacts of mitigation efforts. [, Estonia]	Rejected, this has been deleted
33849	7	2	7	3	This text should reflect the net effect of albedo and other geophysical interactions such as evotranspiration. New studies (Bright et al. 2015) show that the net effect of afforestation in higher latitudes is cooling. The text should also reflect local variations - the conclusion will differentiate within a region. Please consider to include information and language from 4.8.3 in this paragraph. [, Norway]	Rejected, this has been deleted
33851	7	2	7	3	The suggestion that increased albedo causes cooling only regionally seems unprecise. I would rephrase: "Open landscapes in high latitudes have a cooling effect due to increased albedo, particularly during the snowy season. Such effects are immediate, affecting climate locally, while also cumulative, affecting climate globally" [, Norway]	Rejected, this has been deleted
8579	7	2	7	3	This is true but it is important to add that this is a regional effect and that deforestation remains a cause of warming at a global scale. [Marc Aubinet, Belgium]	Accepted and I believe this is clear in sections A4 and A5
15701	7	2	7	3	What is the point to emphasize something concerning only part of the season? For climate impact the net is which matters. And for that whole year and all different climate effects must be accounted for, i.e. carbon, albedo, BVOC-SOA-CCN, evaporation, surface roughness etc. [Tuomo Kallioikoski, Finland]	Accepted, this has been deleted
24517	7	2	7	4	Does snow albedo change? If so, information on quantity? [, Ireland]	Rejected, this has been deleted
20709	7	2	7	5	Add in a comment here about the net balance between cooling effects in high latitudes and warming trends - how much of a difference does this cooling make? [, United Kingdom (of Great Britain and Northern Ireland)]	Rejected, this has been deleted
17741	7	3	7	3	After "increased albedo, thr following could be added: ", and local warming in summer due to decreased evapotranspiration". [, Sweden]	Rejected, this has been deleted
3897	7	3	7	3	Write: "... enhance warming in human settlements including cities and ...". [, Switzerland]	Rejected, this has been deleted
3489	7	3	7	3	"... due to increased albedo." Add: "and local warming in summer due to decreased evapotranspiration." [Gustav Strandberg, Sweden]	Rejected, this has been deleted
26073	7	3	7	3	The sentence beginning "In high latitudes" needs an uncertainty statement [Reid Detchon, United States of America]	Rejected, this has been deleted
38243	7	3	7	4	The warming in cities is a physically driven phenomenon. It is unclear if this sentence is referring to projections of increasing urban populations, or the effect of time on cities. If the authors mean the former, suggest adding the word "increasing" before "urbanisation." This sentence should also make clearer whether the warming in cities will be affecting more people because more people are moving to cities, or whether the effect itself will be stronger. [, United States of America]	Accepted, revised text can be found in point A5.4
22979	7	3	7	5	The paragraph stated that 'Urbanisation will increase warming in cities and their surroundings ...' It should be stressed that with appropriate urban planning, extensively increasing urban green spaces (incuding green walls, roofs etc ...) can reverse this scenario. Urban green infrastrucutre provides helps avoiding the heat island effect and provides multiple benefits including for human health [Anastasios Kentarchos, Belgium]	Rejected. I do not disagree with the premise here, but we are assessing the scientific literature on impacts in this section. Response mechanisms are dealt with elsewhere in the report.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
3905	7	3	7	7	The data (absolute quantities in GtCO ₂ /y, and as % of the total) from AFOLU must be disaggregated: emissions from agriculture and forestry must be given explicitly and separately. [, Switzerland]	Accepted, we have provided this in greater detail in A4
30819	7	4	7	4	is this necessarily true in developed countries - arguably some of the world's most wealthy people live in degraded areas but eat food imported from other places [Mike Morecroft, United Kingdom (of Great Britain and Northern Ireland)]	Noted
26229	7	6	7	7	Is it possible to quantify the influences more precisely, i.e. is it an increase, a decrease, marginally or substantially? [, Luxembourg]	Accepted, in light of other comments, the paragraph has been eliminated and the ideas presented differently in this section
14549	7	6	7	8	There is a broader range of risks to human health from drought (e.g., respiratory diseases, mental health, vector-borne diseases etc) that could be highlighted briefly in the SPM and the Technical Report. [, Canada]	Rejected, impacts such as these are dealt with in later sections
22981	7	6	7	14	The two parts of this para are quite distinct statements. The finding that changes in albedo, fluxes etc have an increasing influence on the climate as degradation increases deserves to be a separate statement. [Anastasios Kentarchos, Belgium]	Accepted, in light of other comments, the paragraph has been eliminated and the ideas presented differently in this section
1565	7	6	7	14	Relevant UK policy-makers, universities, colleges & schools could be encouraged to think of new, creative & innovative ways to help educate current & future generations about such interactions & their consequences. I am also happy to help do so here. [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	Noted
24519	7	6	7	14	Rather diverse - consider shortening and clarifying, i.e. what is the message for policymakers? Also, this covers multiple topics [, Ireland]	Accepted, in light of other comments, the paragraph has been eliminated and the ideas presented differently in this section
30355	7	6	7	14	A3.4. It seems like examples in this paragraph illustrate the exacerbating effect of degradation of ecosystems to regional and local climate change. This point is however not made. The paragraph therefore makes quite a (too) general statement. [, Netherlands]	Accepted, in light of other comments, the paragraph has been eliminated and the ideas presented differently in this section
33853	7	6	7	14	A3.4 looks general and it should be modified [, Norway]	Accepted, in light of other comments, the paragraph has been eliminated and the ideas presented differently in this section
17545	7	6	7	14	Suggest moving the last sentence to the beginning of A3.4, and deleting the corresponding part of the first sentence. [, Sweden]	Rejected, in light of other comments, the paragraph has been eliminated and the ideas presented differently in this section
16425	7	10	7	10	Replace 'impacting' into 'reducing'. [, Republic of Korea]	Rejected, in light of other comments, the paragraph has been eliminated and the ideas presented differently in this section
22051	7	10	7	12	A3.4-Please check: 'Surface albedo, sand and dust aerosols.....land degradation and desertification increase'.....kindly demystify. [Suvadip Neogi, India]	Accepted, in light of other comments, the paragraph has been eliminated and the ideas presented differently in this section
20711	7	10	7	13	Sentence starting 'Surface albedo...' could be simplified by just saying '...influence on climate change as degradation and desertification increase.' [, United Kingdom (of Great Britain and Northern Ireland)]	Rejected, in light of other comments, the paragraph has been eliminated and the ideas presented differently in this section
15703	7	11	7	12	Changes in the vegetation also change BVOC-SOA-CCN feedback loop. [Tuomo Kalliokoski, Finland]	Accepted, in light of other comments, the paragraph has been eliminated and the ideas presented differently in this section
38245	7	11	7	13	Just state geoengineering? [, United States of America]	Rejected, this is not about geoengineering
33855	7	12	7	13	Regarding managed and unmanaged land and impacts of extreme events: consider including examples of both negative and positive effects of land management, preferably also including the term "ecosystem-based adaptation" in this context. [, Norway]	Accepted, in light of other comments, the paragraph has been eliminated and the ideas presented differently in this section
33857	7	12	7	13	The report contains massive amounts of information, which can be overwhelming for the target group(s) of the SPM. Perhaps consider including less details of findings and simplifying the language. One example is the sentence "Both managed and unmanaged land surface processes can increase or decrease the impact of many extreme events": this statement / finding is perhaps too open and general for it to have meaning or be of use to policy makers. [, Norway]	Accepted. This is a general comment and we have tried to adjust the presentation to be more easily readable. Nevertheless, we are presenting something that can be quite complex and we have tried to strike a balance/

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38247	7	12	7	13	This sentence is not a conclusion, but a statement that all possibilities exist. Remove it. [, United States of America]	Accepted
4863	7	15	7	15	Suggest modifying the word "risks" to "risk" or "could risk". [, Japan]	Rejected. The subject of conflict has been moved to section C; this paragraph has been deleted and the section is now more focused on temperature effects.
3899	7	15	7	15	Write: " ... of regions risk aggravating ...": there are two factors, slow onset and long term deterioration in abitability. [, Switzerland]	Rejected. The subject of conflict has been moved to section C; this paragraph has been deleted and the section is now more focused on temperature effects.
20713	7	15	7	15	"Slow onset climate impacts" such as ...? Could you give an example? [, United Kingdom (of Great Britain and Northern Ireland)]	Rejected. The subject of conflict has been moved to section C; this paragraph has been deleted and the section is now more focused on temperature effects.
40271	7	15	7	15	Slow onset OF climate change impacts?? [Thelma Krug, Brazil]	Rejected. The subject of conflict has been moved to section C; this paragraph has been deleted and the section is now more focused on temperature effects.
25137	7	15	7	16	This para would fit better under section A2 as it refers to impacts of CC on land [Alexander Erlewein, Germany]	Rejected. The subject of conflict has been moved to section C; this paragraph has been deleted and the section is now more focused on temperature effects.
22983	7	15	7	16	What about extreme events? [Anastasios Kentarchos, Belgium]	Rejected. The subject of conflict has been moved to section C; this paragraph has been deleted and the section is now more focused on temperature effects.
7245	7	15	7	16	An assessment of this bullet point is required. [Debra Roberts, South Africa]	Rejected. The subject of conflict has been moved to section C; this paragraph has been deleted and the section is now more focused on temperature effects.
1567	7	15	7	16	All relevant UK government departments may need to be urgently reminded that numbers of such migrants fleeing conflict may well rise, as much more work seems needed to fully manage UK borders in future, as has been evidenced here in 2018 & early 2019. [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	Noted
14551	7	15	7	16	Please clarify 'slow-onset climate change impacts'. Is this a categorization? If so, please add another paragraph on 'rapid onset'. [, Canada]	Rejected. The subject of conflict has been moved to section C; this paragraph has been deleted and the section is now more focused on temperature effects.
29895	7	15	7	16	Add evidence/confidence levels. [, Estonia]	Rejected. The subject of conflict has been moved to section C; this paragraph has been deleted and the section is now more focused on temperature effects.
25873	7	15	7	16	Maybe add a bit more text to introduce the other factors, as done for desertification. [, France]	Rejected. The subject of conflict has been moved to section C; this paragraph has been deleted and the section is now more focused on temperature effects.
27565	7	15	7	16	"Slow onset climate change impacts and long term deterioration in habitability of regions risks aggravating conflict, and could trigger spatial population shifts. {7.3.3}" - Important point, please add more specific evidence from the underlying report to the SPM. Please see also our general comment on addressing migration in the SPM. [, Germany]	Rejected. The subject of conflict has been moved to section C; this paragraph has been deleted and the section is now more focused on temperature effects.
24521	7	15	7	16	Is this quantified? Also this point could be outside the scope of the Report [, Ireland]	Rejected. The subject of conflict has been moved to section C; this paragraph has been deleted and the section is now more focused on temperature effects.
30009	7	15	7	16	The reference to section 7.3.3 is incorrect as that section is about the risks of land-based mitigation. [, Netherlands]	Rejected. The subject of conflict has been moved to section C; this paragraph has been deleted and the section is now more focused on temperature effects.
30229	7	15	7	16	Some elaboration on the plausibility and extent of the phenomenon would be appreciated and highly political relevant. The higher frequency and occurrence of fast onset events could further exacerbate the risk. [, Netherlands]	Rejected. The subject of conflict has been moved to section C; this paragraph has been deleted and the section is now more focused on temperature effects.

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30357	7	15	7	16	A3.5 this goes not only for SLOW onset climate change but also for FAST onset climate change [, Netherlands]	Rejected. The subject of conflict has been moved to section C; this paragraph has been deleted and the section is now more focused on temperature effects.
783	7	15	7	16	this paragraph does not include any confidence level. Either it is added or the paragraph should be deleted. [, Spain]	Accepted, in light of other comments, the paragraph has been eliminated and the ideas presented differently in this section
17547	7	15	7	16	Please add a confidence level statement. [, Sweden]	Rejected. The subject of conflict has been moved to section C; this paragraph has been deleted and the section is now more focused on temperature effects.
20715	7	15	7	16	Please add confidence statement. Also can 'spatial population shift' be phrased in a simpler way? Do you mean displacement? Migration? [, United Kingdom (of Great Britain and Northern Ireland)]	Rejected. The subject of conflict has been moved to section C; this paragraph has been deleted and the section is now more focused on temperature effects.
20717	7	15	7	16	Implies spatial population shifts are linked to slow onset climate change impacts and long-term deterioration, and by extension downplays the likelihood that population shifts will occur immediately following a specific weather event. Population shifts occur following harvest failure or in famine conditions, for example. Could you please reword to clarify. [, United Kingdom (of Great Britain and Northern Ireland)]	Rejected. The subject of conflict has been moved to section C; this paragraph has been deleted and the section is now more focused on temperature effects.
38249	7	15	7	16	A3.5 lacks a confidence statement and does not appear to be fully supported by the referenced section of the underlying report. [, United States of America]	Rejected. The subject of conflict has been moved to section C; this paragraph has been deleted and the section is now more focused on temperature effects.
21711	7	15	7	16	This sentence seems to hang and appears unfinished. Also not clear why the term "slow onset" is relevant. Also tends to duplicate A5 [Graham von Maltitz, South Africa]	Rejected. The subject of conflict has been moved to section C; this paragraph has been deleted and the section is now more focused on temperature effects.
29241	7	15	7	16	Although it is written in quite general terms, this is a potentially important and strong statement. I suggest you add confidence and also see if you can make it less general. [Jan Fuglestad, Norway]	Rejected. The subject of conflict has been moved to section C; this paragraph has been deleted and the section is now more focused on temperature effects.
17787	7	15	7	16	Again the current section A.3.5 rather seems to relate to the topic addressed by the head statement in A2 [Quentin Lejeune, Germany]	Rejected. The subject of conflict has been moved to section C; this paragraph has been deleted and the section is now more focused on temperature effects.
26075	7	15	7	16	Paragraph A3.5 needs an uncertainty statement [Reid Detchon, United States of America]	Rejected. The subject of conflict has been moved to section C; this paragraph has been deleted and the section is now more focused on temperature effects.
22053	7	15	7	16	A3.5-Please check:kindly provide confidence statement. [Suvadip Neogi, India]	Rejected. The subject of conflict has been moved to section C; this paragraph has been deleted and the section is now more focused on temperature effects.
30213	7	16	7	16	replace "spatial population shifts" with "migration" [, Netherlands]	Rejected. The subject of conflict has been moved to section C; this paragraph has been deleted and the section is now more focused on temperature effects.
33015	7	17	7	17	re: "land management decisions" - ADD: and wider policy decisions w impacts on land management (not all land management impacts stem from land management decisions, but e.g. happen as a consequence [intended or not] of e.g. economic development making land exploitation more/ less economically viable); adverse side effects of other policies on land management [Rianne ten Veen, Netherlands]	Accepted, the statement has been deleted. Ideas have been transferred to the response options section.
32905	7	17	7	18	land-based mitigation options is a long list of options. IAMs tell us that there are two land-based mitigation options: afforestation and biomass/BECCS. Do not confuse the output of IAMs with the suite of land-based mitigation options under consideration in the report. When providing examples of land-based mitigation options, try extra hard to choose examples that are NOT afforestation and BECCS. Put extra effort into ensuring consistency throughout the report -- land-based mitigation options include dietary change, forest and ecosystem restoration, agroforestry ... [Doreen Stabinsky, United States of America]	Accepted, the statement has been deleted. Ideas have been transferred to the response options section.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
22985	7	17	7	20	"...will continue to affect the climate system, and directly and indirectly impact food security, biodiversity and other socio-economic systems". Please add biodiversity. [Anastasios Kentarchos, Belgium]	Accepted, the statement has been deleted. Ideas have been transferred to the response options section.
22987	7	17	7	20	The paragraph should recognise also that the increasing unpredictability of the weather makes it difficult for land managers to take optimal decisions on land use. So even if the climate provides good conditions for production of certain crops with certain methods, it is increasingly unlikely that land managers will use the optimal crops/methods if they do not know what to plan for. [Anastasios Kentarchos, Belgium]	Accepted, the statement has been deleted. Ideas have been transferred to the response options section.
32251	7	17	7	20	Sustainable land management could also help in adaptation by reducing disaster risk or mitigating effects of extreme event [Carmela Cascone, Italy]	Accepted, the statement has been deleted. Ideas have been transferred to the response options section.
32997	7	17	7	20	Land use and land management decisions – including the extent and scale to which land-based mitigation options (including afforestation, ecosystem restoration and biomass crops) are deployed – will continue to affect the climate system, and directly and indirectly impact food security and other socio-economic systems (high confidence). [Christopher Pereira, Canada]	Accepted, the statement has been deleted. Ideas have been transferred to the response options section.
34075	7	17	7	20	In this section on land-climate interaction, only the first part of this section is well-placed. The second part, i.e. the statement " and directly and indirectly impact food security ..." should be removed. Better add more detail what you exactly refer to here in terms of land use decisions affecting climate: GHG impacts, regional impacts, the latter is already addressed in A3.3.... [Elke Stehfest, Netherlands]	Accepted, the statement has been deleted. Ideas have been transferred to the response options section.
26025	7	17	7	20	This paragraph should be better balanced as for the moment, it only highlights trade-offs situations between mitigation and food security, whereas it also exists land-based mitigation options such as agroecology, including agroforestry on croplands and grasslands, that have some synergies with food security and other services. [, France]	Accepted, the statement has been deleted. Ideas have been transferred to the response options section.
27567	7	17	7	20	Please clarify, whether "land use and land management decisions" only affect "the climate system and directly and indirectly impact food security and other socio-economic systems". We suggest to at least add "water security", "biodiversity" and "ecosystems" as areas to be affected/impacted. It might be also reasonable to add the expression "among others", so the sentence would read: "...and indirectly impact, among others, food security..." as outlined in other SRCCL chapters. [, Germany]	Accepted, the statement has been deleted. Ideas have been transferred to the response options section.
30359	7	17	7	20	A3.6 is an open door. Consider to remove. [, Netherlands]	Accepted, the statement has been deleted. Ideas have been transferred to the response options section.
38251	7	17	7	20	In the phrase "will continue to affect the climate system, and directly and indirectly impact food security and other socio-economic systems" the statement would be clearer if it said whether food security is likely to increase or decrease. It would also help to say the same for "other socio-economic systems" if possible in a brief manner. [, United States of America]	Accepted, the statement has been deleted. Ideas have been transferred to the response options section.
6669	7	17	7	20	The A.3.6. para "Land use and land management decisions – including the extent and scale to which land-based 18 mitigation options (including afforestation, and biomass crops) are deployed – will continue to affect the 19 climate system, and directly and indirectly impact food security and other socio-economic systems (high confidence). {4.3.1, 4.3.3, Table 1}" is repetition of previous paras. May need editing [Mochamad Indrawan, Indonesia]	Accepted, the statement has been deleted. Ideas have been transferred to the response options section.
17789	7	17	7	20	How does this statement relate to 4.3.1 and 4.3.3? And is it referred to Table SPM1 here? [Quentin Lejeune, Germany]	Accepted, the statement has been deleted. Ideas have been transferred to the response options section.
31819	7	17	7	20	this is in a smaller size font [Samantha Grover, Australia]	Accepted, the statement has been deleted. Ideas have been transferred to the response options section.

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22055	7	17	7	20	A3.6-Please check: the extent and scale.....How much? Please provide the degree/magnitude of the extent and scale for easy reference and apprehension of the readers. [Suvadip Neogi, India]	Accepted, the statement has been deleted. Ideas have been transferred to the response options section.
40273	7	17	7	20	This paragraph should be rewritten - since land use and land management decisions WILL impact food security . Need to consider that the decisions might not lead to negative impacts only. There might be the other side of the coin. [Thelma Krug, Brazil]	Accepted, the statement has been deleted. Ideas have been transferred to the response options section.
25875	7	18	7	18	By « biomass crops », do you mean « energy crops » ? If yes, we suggest to use of the second one which is more accurate. [, France]	Accepted, the statement has been deleted. Ideas have been transferred to the response options section.
6043	7	18	7	18	More options should be added (such as sustainable forest management), as it currently focuses only on two mitigation options creating a false impression that these are the two primary mitigation activities. This is also highlighted on p.15 [, Poland]	Accepted, the statement has been deleted. Ideas have been transferred to the response options section.
17549	7	18	7	18	It is not clear what "will continue to" implies. Suggest deletion of these three words. [, Sweden]	Accepted, the statement has been deleted. Ideas have been transferred to the response options section.
31821	7	18	7	18	no comma required after afforestation [Samantha Grover, Australia]	Accepted, the statement has been deleted. Ideas have been transferred to the response options section.
31545	7	18	7	19	... - will continue to affect and be affected by the climate system [, Brazil]	Accepted, the statement has been deleted. Ideas have been transferred to the response options section.
12585	7	19	7	19	Suggested addition after: 'will continue to affect the climate system' : as well as other natural systems such as biodiversity or soil health [Carina Millstone, United Kingdom (of Great Britain and Northern Ireland)]	Accepted, the statement has been deleted. Ideas have been transferred to the response options section.
17369	7	19	7	19	The SPM should list impacts on biodiversity and ecosystem services here too. [Taehyun Park, Republic of Korea]	Accepted, the statement has been deleted. Ideas have been transferred to the response options section.
16427	7	20	7	20	Table 1' is to be changed to 'Table 4.1'. [, Republic of Korea]	Noted, tables have been appropriately labeled.
24405	7	22	7	23	We suggest to add "and land use change" after "land use" [, Belgium]	Accepted - the text has been substantially revised.
7247	7	22	7	24	An assessment of this bullet point is required. [Debra Roberts, South Africa]	Accepted - this is elaborated the new SPM
1569	7	22	7	24	UK government humanitarian relief efforts might benefit from being further targeted to help the relevant people concerned here. [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	Noted
27569	7	22	7	24	Please provide further information on key drivers and the options to prevent land degradation. In addition, please add an uncertainty range to the second sentence. [, Germany]	Partially accepted - drivers and options are elaborated but part of different sections of the new SPM
24523	7	22	7	24	Loss of carbon from soils and biomass should be mentioned here. Links between 2nd sentence and climate need to be clearer [, Ireland]	Accepted - the text has been substantially revised.
24227	7	22	7	24	Affected populations across the land degraded regions are of different quantitative levels, and this need to be clearly reflected in this session of the SPM, as well as in its related text and chapter. Population in the deserts, arid, semi-arid areas are very much bigger than those that are in ice-free areas. This shows better the most impacted populations as well as the risks they're facing. [Kamal Djemouai, Algeria]	Accepted - this is elaborated the new SPM , section A2.2
22057	7	22	7	24	A4-Please check: kindly provide confidence statement. [Suvadip Neogi, India]	Accepted - this is elaborated the new SPM
29751	7	22	7	24	This section would benefit from acknowledging the importance of culturally appropriate sources of nutrition (not just adequate nutrition). [Tanya Smith, Canada]	Accepted - but the A4 bullet has changed substantially
3409	7	23	7	23	Please check whether the '1 billion people' mentioned here is supported by any literature in the underlying report. [, China]	Noted - the text has changed substantially and numbers have been verified
7249	7	23	7	24	The line of sight for the second sentence in this bullet should be provided. [Debra Roberts, South Africa]	Noted - the text has changed substantially and line of sight has been provided
16429	7	23	7	24	There is no additional explanation on this sentence even A4.1.~A4.5. Please present some specific references. [, Republic of Korea]	Noted - the text has changed substantially

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27783	7	23	7	24	There is no rationale or explanation for the second sentence of the Headline A4. Please present the references. [Raehyun Kim, Republic of Korea]	Noted - the text has changed substantially
31825	7	23	7	24	this sentence does not make sense: at the end it needs to specify what the people are the worst affected by: replace "are among the worst affected " with "will experience further negative food security impacts as climate change continues." [Samantha Grover, Australia]	Noted - the text has changed substantially
3901	7	24	7	24	Write: "...among the most heavily affected." . [, Switzerland]	Noted - the text has changed substantially
31823	7	24	7	24	use "degraded lands" in place of "land degraded areas" as it makes more sense [Samantha Grover, Australia]	Accepted
40275	7	24	7	24	suggest changing worst by MOST [Thelma Krug, Brazil]	Noted - the text has changed substantially
8845	7	25	7	25	delete 'across all aspects' for clarity [Jean-Luc Chotte, France]	Noted - the text has changed substantially
17371	7	25	7	25	The SPM should make a clearer reference to the needed action by parties. Suggestion to edit to: "Limiting warming 'through immediate and significant cuts in anthropogenic GHG emissions' would ..." [Taehyun Park, Republic of Korea]	Noted - response options are elaborated in other sections of the SPM
8821	7	25	7	26	I suggest to include the terminology of LDN in the phrase "Limiting warming would lower risks across all aspects of desertification, land degradation and food security" and refer more to avoid the increase on land degradation [Jean-Luc Chotte, France]	Accepted partially - LDN has been elaborated in other sections of the SPM
22989	7	25	7	28	This statement should be elaborated: e.g. by providing quantified examples of the extent to which some of the phenomena listed would be lowered by limiting warming? [Anastasios Kentarchos, Belgium]	Noted - the text has changed substantially
1571	7	25	7	28	All relevant stakeholders could be further encouraged to make alternative plans to manage reducing crop yields, and food producers urged by the UK government to innovate on how to increase the nutritional value of existing food if such crop yields decrease, to best help safeguard UK public health. [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	Noted
27571	7	25	7	28	Please provide some summary statements on Figures SPM 3.a and b in the text by a complete sentence, not only by a list of aspects. [, Germany]	Noted - the text has changed substantially
24525	7	25	7	28	This has been addressed in SR1.5. Why is it included here? [, Ireland]	Noted
20719	7	25	7	28	A4.1 would be better if moved to section B1, as it relates to mitigation. [, United Kingdom (of Great Britain and Northern Ireland)]	Accepted - response options are elaborated in other sections of the SPM
38253	7	25	7	28	The wording of this conclusion is hard to follow. [, United States of America]	Noted - the text has changed substantially
3903	7	29	7	29	Write: "... affects currently between ...". [, Switzerland]	Noted - the text has changed substantially
25877	7	29	7	30	It is not appropriate to cite only one region in A4. We suggest to give figures at the global level and/or to include examples from other regions and to provide information in A4.2 about the links with climate change, which is not the case yet. [, France]	Accepted - the text has changed substantially
30169	7	29	7	30	How can 4-10% of cropland + 27-68% of pastureland + 1-8% of forested land count up to 40-66% of total land? That seems mathematically impossible. We suggest to use a more relevant global number from section 4.5.1 page 30, lines 16-17: "...between 22% and 24% of the global land area was subject to a downward trend, while about 16% showed an increasing trend." In that case, the reference to chapter 7 can be deleted. [, Netherlands]	Accepted - the text has changed substantially
7707	7	29	7	30	The range of percentage should be shown with timespan or range of warming (temperature). [Hiroaki Kondo, Japan]	Accepted - the text has changed substantially
17373	7	29	7	32	This paragraph lacks connection to climate change and is specific to one region only. [Taehyun Park, Republic of Korea]	Accepted - the text has changed substantially
24771	7	29	7	32	why only mention of Central Asia? [Viridiana Alcantara Cervantes, Germany]	Accepted - the text has changed substantially

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25139	7	29	7	33	Better use global figures on land degradation rather than examples from one specific region [Alexander Erlewein, Germany]	Accepted - the text has changed substantially
22993	7	29	7	33	Unclear why Central Asia is singled out. [Anastasios Kentarchos, Belgium]	Accepted - the text has changed substantially
6793	7	29	7	33	"In Central Asia, it is estimated that land degradation affects between 4-10% of cropped land, 68% of pasture land and 1-8% of forested land. This equates to about 40-66% of land in total. The costs counteracting land degradation in Central Asia are estimated to be six times greater than the cost of action in the form of sustainable sustainable management (low evidence, medium agreement). {4.4.4, 4.5.1, 33 4.5.2, 7.4 .1} ". The conclusions of this paragraph quote Chapter 4, but there is no assessment of Central Asia in Chapter 4. Central Asia locate in dryland region, but Chapter 4 should assess the land degradedation in nondryland regions. Please correct it. [Changke Wang, China]	Accepted - the text has changed substantially
7251	7	29	7	33	Why is the focus of this bullet only on Asia? Consider starting with the global picture then move to regional differences pointing out Asia as an example [Debra Roberts, South Africa]	Accepted - the text has changed substantially
1573	7	29	7	33	Please see the earlier points made in feedback on A1.1. above. [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	Noted
29897	7	29	7	33	Why is Central Asia singled out here? These kind of detail belongs to the main body of the report. Instead of a single region global numbers should be given here or the paragraph deleted. [, Estonia]	Accepted - the text has changed substantially
27573	7	29	7	33	We appreciate the quantification in the statement A4.2 and encourage the authors to quantify statements in particular in the SPM wherever possible and appropriate. However it is not clear to us, why only the region of Central Asia is mentioned in A4. Also, the last sentence features a "low evidence, medium agreement" confidence level. We suggest to either put the statements regarding Central Asia into context for example by comparing them with other regions or to delete this sub bullet. [, Germany]	Accepted - the text has changed substantially
24527	7	29	7	33	Details on global land degradation, including degradation of high carbon soils/wetlands, would be useful here- a regional example can be provided if needed, but the reason for doing so should be clear [, Ireland]	Accepted - the text has changed substantially
4865	7	29	7	33	Suggest deleting "4.4.4, 4.5.1, 4.5.2" in the reference because any information related to A4.2 cannot be found in these sections. [, Japan]	Accepted - the text has changed substantially
2983	7	29	7	33	It is a very important and clearly shaped statement. However, 'low evidence, medium agreement' can confuse readers. [, Russian Federation]	Noted
17551	7	29	7	33	It is not clear why Central Asia is selected here. The statement should be made more general with additional regions / global scale included, or the selection criteria provided. [, Sweden]	Accepted - the text has changed substantially
20721	7	29	7	33	is there a reason central asia is singled out? If there is, could this be stated? Also, what are the causes of this? Just climate change, or the other factors mentioned? It would be helpful if a broader regional perspective were presented. [, United Kingdom (of Great Britain and Northern Ireland)]	Accepted - the text has changed substantially
38255	7	29	7	33	Paragraph A.4.2 appears to encompass land degradation broadly, and not focus on climate-related elements. Suggest either ensuring the climate perspective of the underpinning analysis is clear, or deleting. [, United States of America]	Accepted - the text has changed substantially
1681	7	29	7	33	why here just refered to land degradation in century Asia ? Other regions also have serious land degradation [guosheng wang, China]	Accepted - the new SPM has been substantially revised
17791	7	29	7	33	Is there anything about the linkage to climate change that can be added to this point? Otherwise it seems a little out of place [Quentin Lejeune, Germany]	Accepted - the text has changed substantially

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27785	7	29	7	33	This paragraph explain only 'Central Asia' region. However, the land degradation occurring all of the earth. Please extend the example region in this paragraph. [Raehyun Kim, Republic of Korea]	Accepted - the text has changed substantially
22059	7	29	7	33	A4.2-Please check: What about Africa? [Suvadip Neogi, India]	Accepted - the text has changed substantially
23775	7	30	7	30	Were the areas under desertswhen it is mentioned that about 60% of total land..... [, India]	Accepted - the text has changed substantially
26231	7	30	7	30	Is the total of land (40-66%) to Central Asia or to the global land area? [, Luxembourg]	Accepted - the text has changed substantially
38257	7	30	7	30	It would be better to state "40-66% of land in the region" as "land in total" implies a global estimate. [, United States of America]	Accepted - the text has changed substantially
32673	7	30	7	30	There is more to climate change than just warming. Deforestation in tropical areas also influences precipitation, wind patterns, etc. (See e.g, Chapter 2, Section 2.6) [Jean-Pascal van Ypersele, Belgium]	Noted - but not relevant to this bullet
25253	7	30	7	30	Did you consider the areas under desertswhen it is mentioned that about 60% of total land..... [Naresh Kumar Soora, India]	Accepted - the text has changed substantially
31827	7	30	7	30	add "of" after 'costs" [Samantha Grover, Australia]	Noted - the text has changed
30173	7	30	7	31	This sentence is incorrectly copied from section 7.4.1.1."The costs counteracting land degradation..." should be changed into: "The costs of inaction to counteract land degradation...", which has a very different meaning! [, Netherlands]	Accepted - the text has changed substantially
26077	7	30	7	31	Add the word "of" after "costs" [Reid Detchon, United States of America]	Accepted - the text has changed substantially
41705	7	30	7	32	It is unclear is this is the "Current climate change" or if this is some scenario - this is not the palce for futre sceanrio discussion I believe. If current, then state that. [Michael Prather, United States of America]	Accepted - the text has changed substantially
30361	7	30	7	33	A4.2: would the investment in sustainable land management counteract land degradation in central asia? Is land degradation there merely caused by unsustainable use or merely by climate change? [, Netherlands]	Accepted - the text has changed substantially
30821	7	30	7	33	I'm not clear what the distinction is - what is 'counteracting land degradation' is it isn't sustainable land management? Is the distinction between restoring degraded land vs. using it sustainably in the first place? If so more clarity is needed [Mike Morecroft, United Kingdom (of Great Britain and Northern Ireland)]	Accepted - the text has changed substantially
38259	7	31	7	32	Change "The costs counteracting land" to "The costs of counteracting land". [, United States of America]	Noted - the text has changed substantially
4867	7	31	7	33	It is stated that "the costs counteracting land degradation" is six times greater than "the costs of action in the form of sustainable land management". However, first of all, reasons why such "sustainable land management" of much lower costs has not been realized in the real world would need to be described. Are there any barriers against taking actions? Are implicit costs lying in the real world considered properly? Regarding this point, assumptions of existing studies should be mentioned. [, Japan]	Accepted - the text has changed substantially
8213	7	31	7	33	Could it be made more clear that «counteracting land degradation» is different from «sustainable land management» [Harold Leffertstra, Norway]	Noted - the text has changed substantially

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38261	7	32	7	32	This is the first mention of the term "sustainable land management" in the body of the SPM text. As drafted, this term is in the title of the report, and discussed extensively in the SPM, but never defined for the reader. Section 1.4.1.1 of the report gives a good definition, "the use of land resources for the production of goods to meet changing human needs while assuring the long-term productive potential of these resources and the maintenance of their environmental functions," and this description should be carried into the SPM. One option would be for the SPM to include a "core concepts" box that explains terms like "sustainable land management." [, United States of America]	Noted - the text has changed substantially
30061	7	32	7	33	Statement A4.2 is based on section 7.4.1 only (i.e. line 11 and 12 on page 7-32 and line 27 and 28 on page 7-30). So remove references to sections 4.4.4, 4.5.1, 4.5.2). [, Netherlands]	Accepted - the text has changed substantially
38263	7	34	7	34	The baseline for global warming temperatures should be clear. Presumably this refers to preindustrial time, but not sure. [, United States of America]	Accepted - the text has changed substantially
38265	7	34	7	36	The first sentence should reference Section 7.1. [, United States of America]	Noted - the text has changed substantially
30065	7	34	7	37	Please make sure it is clear to the reader where this 7% comes from. See our comment on this topic. [, Netherlands]	Accepted - the text has changed substantially
27575	7	34	7	38	Are these statements assuming present day land management practices? Can these shifts be avoided? Will the additional 10%/°C extinction be caused by global warming alone or by both warming and LUC? There cannot be a linear relationship, i.e. would a rise from 1°C to 2°C have the same impact as a rise from 4°C to 5°C? What is the impact of the rate of global warming, i.e. what would be the difference, if the warming of 1°C will happen during the next decades or the next centuries. How about temperature overshooting? Please clarify. [, Germany]	Accepted - the text has changed substantially
30823	7	34	7	38	'will likely' doesn't seem the right language for such specific numbers. Would 'projections indicate' be better? [Mike Morecroft, United Kingdom (of Great Britain and Northern Ireland)]	Accepted - the text has changed substantially
32253	7	34	7	39	The rate of population loss in terrestrial vertebrates is extremely high—even in “species of low concern”. Therefore also consider intraspecific variability and smalls population of non endemic species in the analysis of spatial distribution of individual land challenges - References: 1) Ceballos G., Ehrlich P.R., and Dirzo R. (2017) Biological annihilation via the ongoing sixth mass extinction signaled by vertebrate population losses and declines Proc Natl Acad Sci USA 114 (30): E6089–E6096. 2) Ceballos G., Ehrlich A.H., Ehrlich P.R. (2015) The Annihilation of Nature: Human Extinction of Birds and Mammals (Johns Hopkins Univ Press, Baltimore). 3) Ceballos G., Ehrlich P.R., Barnosky A.D., Garcia A., Pringle R.M. , Palmer T.M. (2015) Accelerated modern human–induced species losses: Entering the sixth mass extinction Sci Adv. 2015 Jun; 1(5): e1400253. Published online 2015 Jun 19. doi: 10.1126/sciadv.140025 [Carmela Cascone, Italy]	Noted

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6795	7	34	7	39	These conclusions does not give uncertainty language, and section 7.3.2 (page 17 line 12-15) draws a conclusion only based on one literature published in 2007. Please update and add enough literatures. "Parry et al. (2007) suggest that approximately 10% of species assessed so far will be at an increasingly high risk of extinction for every 1 °C rise in global mean temperature, within the range of future scenarios modelled in impacts assessments (typically <5 °C global temperature rise." In addition,, there is no "Under global warming of 1.5°C, combinations of climate change and land use change will likely drive 7% of current ecosystems to new biome in the types, such as forest to grassland, and grassland to arid desert (medium evidence, high agreement) " in {7.3.2}. Please correct it. [Changke Wang, China]	Accepted - the text has changed substantially
34077	7	34	7	39	last sentence "these impacts are not fully reflected or quantified ..." there is no reference for this to the main report, and the statement is confusing, as it suggests that this is a problem.... As far as I understand modelled pathways show ways how to achieve a target. ignorance of impacts is not a problem, but ignoring feedback is. So such a statement is only valid when referring to a specific feedback (e.g. species extinction -> breakdown of ecosystem -> carbon loss of this ecosystem would ne a feedback). [Elke Stehfest, Netherlands]	Accepted - the text has changed substantially
3411	7	34	7	39	"A4.3. Under global warming of 1.5°C, combinations of climate change and land use change will likely drive 7% of current ecosystems to new biome types, such as forest to grassland, and grassland to arid desert (medium evidence, high agreement), and reduce the functionality, stability, and adaptability of ecosystems. Approximately an additional 10% of terrestrial species assessed will be at an increasingly high risk of extinction for every 1°C rise in global mean temperature {7.3.2}. These impacts are not fully reflected or quantified in integrated assessment model pathways." This conclusion comes from a literature published in 2007 and with no expression of confidence. So it is suggested to consider whether the conclusion is supported with additional studies and its confidence is consistent with that in 1.5 SP. [, China]	Accepted - the text has changed substantially
24529	7	34	7	39	Not clear on the value of this bullet. The comment on IAMs is of interest but ay be misplaced here. It would be useful to point to the need to improve the interface between Earth systems models and IAMs to inform policy but if this is the message it is unclear [, Ireland]	Accepted - the text has changed substantially
30363	7	34	7	39	A4.3 this point (ecosytem and biodiversity loss due to shifting an deteriorating of ecosystems) deserves more attention and should be mentioned in the headline statement A4 [, Netherlands]	Accepted - the text has changed substantially
33859	7	34	7	39	The effect of warming on coasts and effects on coral reefs should be highlighted. (Ref. 7.1 "Within the 1.5 degrees range of warming, significant threats exist human settlements near coasts, food systems at low latitudes, and ecosystems related to coral reef tipping points (high agreement, high evidence)". Please consider to include such information in the SPM and including a reference to the SR1.5 would be prudent on this matter. [, Norway]	Accepted - the text has changed substantially
21713	7	34	7	39	I could not find clear tractability for this section in 7.3.2 [Graham von Maltitz, South Africa]	Accepted - the text has changed substantially

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27899	7	34	7	39	The increased atmospheric GHG concentrations is not adequate reflected in this para. It seems not to qualify that the increased temperature will be as a result of increased GHG in the atmosphere, which favors tree growth and will in most instances result in grassland changing into woodland (i.e. bush thickening or encroachment). This is already evident in most southern African countries, including South Africa. We have also done a significant amount of research on this. [Itchell Guiney, South Africa]	Accepted - the text has changed substantially
1575	7	34	7	47	Greater publicity could be given by the UK government to such developments, so humans are more aware of land erosion, especially agricultural workers, people living near flood plains & delta areas, and to know the risks & consequences of wildfires arising, as seen in California, USA in 2018. Early signals are that such phenomena could occur in the UK with more frequency too. [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	Noted
2985	7	35	7	35	7%' of what? Area, populations, others? [, Russian Federation]	Accepted - the text has changed substantially
29899	7	37	7	38	Add evidence/confidence levels. [, Estonia]	Accepted - the text has changed substantially
30067	7	37	7	38	This 10% is based on only one 11 year old study by Parry et al. In chapter 7 it reads that this study "suggests" that such an impact may occur. It would be more correct to formulate this as follows: "One study suggests that approximately an additional 10% of terrestrial species assessed will be at an increasingly high risk of extinction for every 1°C rise in global mean temperature" [, Netherlands]	Accepted - the text has changed substantially
38267	7	37	7	38	This sentence relies on a single study. It should state that "A 2007 study suggests that approximately an additional 10% of terrestrial species assessed...." [, United States of America]	Accepted - the text has changed substantially
4869	7	37	7	39	The temperature range, in which an additional 10% of terrestrial species will be at an increasingly high risk of extinction for every 1°C rise in global mean temperature, would need to be clarified. [, Japan]	Accepted - the text has changed substantially
41709	7	37	7	39	I urge you to put a footnote here on "high risk of extinction" since this field of study is traceable and quantifiable (e.g.,high risk may be loss of 50% or more of current habitat?) This is in contrast to the "high risk" in Figure SPM-3 which, as correctly noted, has no clear definition and is a subjective assessment of the authors who prepared the figure. [Michael Prather, United States of America]	Noted - the text has changed substantially
22061	7	37	7	39	A4.3-Please check: 'Approximately an additional.....integrated assessment model pathways'.....kindly provide confidence statement. [Suvadip Neogi, India]	Noted - the text has changed substantially
20723	7	38	7	38	Nor are these impacts adequately valued/monetised - include a comment to this effect [, United Kingdom (of Great Britain and Northern Ireland)]	Noted - the text has changed substantially
17375	7	38	7	38	This should rather say: "These impacts are not at all sufficiently reflected or quantified in integrated assessment model pathways." [Taehyun Park, Republic of Korea]	Noted - the text has changed substantially
22995	7	38	7	39	What is the purpose of the sentence here on integrated assessment models? Clarify or remove. Is it to highlight that some model results (e.g. GDP outcomes) do not fully capture expected impacts? Is it to point out that some model inputs (e.g. biomass availability) once impacts are fully considered? [Anastasios Kentarchos, Belgium]	Accepted - the text has changed substantially
27577	7	38	7	39	Please expand this sentence and explain the relevance of these shortcomings versus the robust lessons that can be learned from IAMs for the main findings of the SRCCL and for decision making, drawing on the assessments provided in chapters 1 and 7. [, Germany]	Noted - the text has changed substantially

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30175	7	38	7	39	Remove the last sentence of statement A4.3 (if statement A4.3 remains at all, see other comments why we think it should not). [, Netherlands]	Noted - the text has changed substantially
38269	7	38	7	39	The last sentence lacks a source and a confidence statement. [, United States of America]	Noted - the text has changed substantially
2987	7	40	7	41	Where? Increasing rainfall in arid lands may be beneficial... [, Russian Federation]	Rejected - increasing rainfall intensity is different from increasing rainfall.
7253	7	40	7	44	Line of sight required for this bullet. [Debra Roberts, South Africa]	Accepted - the text has changed substantially
24531	7	40	7	44	Presumable degradation implies carbon loss. For a report on climate change, carbon loss is a key issue and should be quantified or its scale provided [, Ireland]	Accepted - the text has changed substantially and carbon losses included
24651	7	40	7	44	Presumably degradation implies carbon loss. For a report on climate change, carbon loss is a key issue and should be quantified or its scale provided [, Ireland]	Accepted - the text has changed substantially and carbon losses included
38271	7	40	7	44	Section A4.4 needs to provide references to the underlying chapters. [, United States of America]	Accepted - the text has changed substantially
1683	7	40	7	44	ground cover change to vegetation cover [guosheng wang, China]	Noted - the text has changed substantially
22063	7	40	7	44	A4.4-Please check: Kindly cite reference from where it has been adopted. [Suvadip Neogi, India]	Accepted - the text has changed substantially
20725	7	40	7	45	A4.4 and A4.5 very helpfully indicate some of the climate-driven causes of land degradation. However, it would also be helpful to precede this with some of the human-driven causes, given that the text mentions that climate change exacerbates existing processes. The text from the chapter 4 executive summary that says 'Land degradation occurs as a result of conversion of tropical forests to agriculture and in agriculture worldwide wherever land management is unsustainable' (p4-4 line 19/20) could be moved to the summary for policy makers to indicate this. [, United Kingdom (of Great Britain and Northern Ireland)]	Noted - the text has changed substantially
17553	7	41	7	41	What does "ground cover" refer to? Vegetation? Top soil? [, Sweden]	Accepted - the text has changed substantially
29901	7	42	7	44	This is an important statement, but needs to be made clearer. What kind of land/water use and what kind of impacts are meant here? [, Estonia]	Accepted - the text has changed substantially
7709	7	42	7	44	Font size is inconsistent. [Hiroaki Kondo, Japan]	noted
20727	7	43	7	43	Is this something that "will" happen or is happening right now? If the latter then the word "will" should be removed. [, United Kingdom (of Great Britain and Northern Ireland)]	Accepted - the text has changed substantially
33861	7	45	7	46	Quotation: "A4.5. Wildfire regimes are being increasingly driven by changes in temperature, alongside droughts and human activity". Consider to add "management practices" to the list [, Norway]	Accepted - the text has changed substantially
22997	7	45	7	47	Saying that climate change and other factors contribute to wildfires is not novel. The statement should include some greater level of detail about the additional contribution of climate change. E.g. by how much does it increase the incidence? Would reductions in the contributing human activity reduce the potential climate change impacts? etc. [Anastasios Kentarchos, Belgium]	Accepted - the text has changed substantially
32255	7	45	7	47	Land degradation could be also due to human inactivity, such as unmanagement of forest ecosystems deriving from natural expansion producing loss of landscape diversity and resilience [Carmela Cascone, Italy]	Noted
27579	7	45	7	47	Please assess also implications for human security and economic damages. [, Germany]	Accepted - the text has changed substantially, issues of human security have been included in other sections
27581	7	45	7	47	The SPM mentions implications of shifting wildfire regimes on people and refers to CC-Box 2 and chapter 4.4, but these do not provide such information. Please provide references to correct place in report. [, Germany]	Accepted - the text has changed substantially

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
24533	7	45	7	47	Can some quantification of changes in wildfires be provided? Also mention of biomass burning as part of land management in certain regions, and a quantification of this, would be very useful in the Report [, Ireland]	Accepted - the text has changed substantially
2989	7	45	7	47	How fire regimes are impacted by air quality? [, Russian Federation]	Noted
20729	7	45	7	47	What about increased emissions from wildfires driving further climate change? Could anything be said about this? [, United Kingdom (of Great Britain and Northern Ireland)]	Accepted - the text has changed substantially and emissions from fire have been included
20731	7	45	7	47	This is quite a weak statement. It could be strengthened by adding something on what the implications are (i.e. are they negative?) for example "...alongside droughts and human activity, leading to [negative?] land-use change, increasing land degradation, and worsening air quality." [, United Kingdom (of Great Britain and Northern Ireland)]	Accepted - the text has changed substantially
31829	7	45	7	47	A4.5 is unclear and poorly written. The meaning is not coming through, please return to the author. Perhaps more than one sentence is required to express the underlying ideas. [Samantha Grover, Australia]	Accepted - the text has changed substantially
22065	7	45	7	47	A4.5-Please check: Relative humidity (RH) in air? [Suvadip Neogi, India]	Noted - the text has changed substantially
17377	7	45	7	47	Besides draughts and changes in temperatures it might be valuable to include heat stress and the abundance of fire prone secondary forests consisting of fast burning tree species in monocultural structures. [Taehyun Park, Republic of Korea]	Accepted - heat stress has been included in the revised SPM
17379	7	45	7	47	This paragraph should address the increase in GHG emissions these increases of naturally and human triggered fires will cause [Taehyun Park, Republic of Korea]	Noted - the text has changed substantially
6045	7	47	7	47	Addition: This underlines the importance of proper fire management practices. [, Poland]	Accepted - the text has changed substantially
25871	7	47	8	1	Irrigation in agriculture is often mentioned as an example of adaptation to climate change. We would like to recall the possible side effects on the resource, et we propose to explain here the concept of incremental adaptation (where a strong focus on irrigation can be often seen) and of transformational adaptation where a shift to other crops and/other agricultural systems like agroecology agroforestry may lead to a lesser need of irrigation. cf. GENERAL COMMENT on incremental vs transformational adaptation and mitigation. [, France]	Noted - ut out of place here
6851	7	29	27	33	Unclear why Central Asia is mentioned here as the only region. Either mention several regions or leave this out. Elsewhere in the main chapters the relation between costs and benefits is mentioned - could be cited here. [Markus Giger, Switzerland]	Accepted - the text has changed substantially
16423	7	2			Please add ", " after "In high latitudes". [, Republic of Korea]	Rejected, this has been deleted
2079	7	2			Robust Evidence/high agreement [Tomas Molina, Spain]	Noted, I am not sure I understand what is meant here.
15859	7	3			"..." due to increased albedo relatively to the one of a persistent snow cover" [Caroline Vincke, Belgium]	Rejected, this has been deleted
27781	7	3			please add ", " after "In high latitudes" [Raehyun Kim, Republic of Korea]	Rejected, this has been deleted
41689	7	4			I would think that regional aerosol forcing of total RF and local percept would be high on the list here. [Michael Prather, United States of America]	Rejected. The section has been revised and aerosols are dealt with elsewhere.
2081	7	4			Robust Evidence/high agreement [Tomas Molina, Spain]	Noted, I am not sure I understand what is meant here.
2083	7	7			Robust Evidence/high agreement [Tomas Molina, Spain]	Accepted, in light of other comments, the paragraph has been eliminated and the ideas presented differently in this section
15861	7	8			"such abiotic extreme events, often followed by biotic hazards, can substantially affect ecosystems and agricultural production, directly and with delayed impacts, further exacerbating land degradation, plant fitness, desertification and impacting food security". [Caroline Vincke, Belgium]	Accepted, in light of other comments, the paragraph has been eliminated and the ideas presented differently in this section

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
41691	7	8			Heavy precip events are driven globally by warming wetter atmosphere. Locally they can MAYBE be driven by fires and aerosols, but that is with much less confidence. This sound like it is the land-use that drives these. Rewrite. [Michael Prather, United States of America]	Accepted, in light of other comments, the paragraph has been eliminated and the ideas presented differently in this section
15863	7	11			land degradation is not the same as ecosystems degradation. It is necessary to distinguish them in terms of processes/indicators. [Caroline Vincke, Belgium]	Rejected. I do not want to get into a definition discussion and the paragraph has been eliminated
15865	7	12		13	I do not understand this sentence: the processes are managed or unmanaged or the land surface? [Caroline Vincke, Belgium]	Accepted, in light of other comments, the paragraph has been eliminated and the ideas presented differently in this section
41693	7	12			"processes" cannot be managed. The processes are the same, they vary in different land use regions. Sentence does not make sense. [Michael Prather, United States of America]	Accepted, in light of other comments, the paragraph has been eliminated and the ideas presented differently in this section
41695	7	15			OK, but rapid onset climate change is probably even worse than slow. Rework to say that it is obvious rpaid is bad, but slow may also be very bad. Conflicts from slow degradation may have little literature? Does it? [Michael Prather, United States of America]	Rejected. The subject of conflict has been moved to section C; this paragraph has been deleted and the section is now more focused on tempreature effects.
15867	7	18			why focus on those two? are they considered more important? if yes, needed to say it. [Caroline Vincke, Belgium]	Accepted, the statement has been deleted. Ideas have been transferred to the response options section.
41697	7	23			drop the 'impacts' [Michael Prather, United States of America]	Noted - the text has changed substantially
41699	7	24			reorder: 'in degraded land areas....' [Michael Prather, United States of America]	Noted - the text has changed substantially
15869	7	26			"...changes in vegetation, including large scale mortality..." [Caroline Vincke, Belgium]	Noted - the text has changed substantially
41701	7	26			why the colon? [Michael Prather, United States of America]	Noted - the text has changed substantially
22991	7	27			this should be 'very high confidence' [Anastasios Kentarchos, Belgium]	Noted - the text has changed substantially
15871	7	29			why just a section on Central Asia? [Caroline Vincke, Belgium]	Accepted - the text has changed substantially
23297	7	29			Why does this zoom into Central Asia ? And why not other regions ? The rationale needs to be spelt out e.g. Different regions are affected by degradation to different extents. Central Asia is'. In line 30 should this read 'The benefits of counteracting land degradation etc' ? [Mark Howden, Australia]	Accepted - the text has changed substantially
41703	7	29			...currently affects... [Michael Prather, United States of America]	Accepted - the text has changed substantially
2051	7	32			All the sentence related to Low evidence, medium agreement should be erased. If there is so small certainty, the sentence just brings noise to the text of SPM [Tomas Molina, Spain]	Noted - the text has changed substantially
17793	7	34			Land use change is not quantifiable in terms of global warming, and there are many ways land and land use could look like in a 1.5°C world. Therefore, estimating impacts of land use change under 1.5°C of global warming is a shortcut that assumes a specific land-use pattern. As this report focuses on Land, this assumption should at the minimum be made explicit. Moreover, it would be extremely useful to develop throughout the report on how much specific land-use choices may exacerbate or alleviate impacts of global warming, in particular by relating them to the global pathways (SSPs) that underlie many findings presented in this report. [Quentin Lejeune, Germany]	Noted - the text has changed substantially
41707	7	35			emphasize that this is a "threshold, likely irreversible over the next century" [Michael Prather, United States of America]	Noted - the text has changed substantially
15873	7	38			These impacts, and their positive/negative feedbacks, are not fully... [Caroline Vincke, Belgium]	Noted - the text has changed substantially
15875	7	41			...could lead to significant increases in soil degradation risk... [Caroline Vincke, Belgium]	Noted
2069	7	42			Very high [Tomas Molina, Spain]	Noted

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
41711	7	43			How can you talk about floodplains and delta without highlighting sea level rise? This needs to be in the SPM [Michael Prather, United States of America]	Accepted - the text has changed substantially
2071	7	44			Very high [Tomas Molina, Spain]	Noted - the text has changed substantially
41713	7	45			need to add "pests" as a major source of wildfire change. Certainly true for fires in western US. Yes, they are driven by CC. [Michael Prather, United States of America]	Accepted - the text has changed substantially
15877	7	46			..air quality and food security. [Caroline Vincke, Belgium]	Accepted - the text has changed substantially
41715	7	46			the implications of wildfires are ALSO for GHGases. Should be included. [Michael Prather, United States of America]	Accepted - the text has changed substantially and emissions from fire have been included
15767	7				SPM B: Projected changes: In this section, there is more details than the previous section. It is suggested that the balance and coordination between these two parts should be taken into account so that the effects of climate change on the Cryosphere and the oceans are well understood by decision makers and settlers at different levels. [, Iran]	Noted - the text has been changed substantially
15293	8	1	8	20	Suggest this Box should provide an estimate of the trend in greenhouse gas fluxes that are directly related to agriculture, forestry and other land use. [, Australia]	This box has been removed. The information on trends in GHG fluxes has been included in the second draft - section A, and in Figure SPM 1. this includes additional information on trends related to agriculture and food production
15295	8	1	8	20	Suggest this Box should provide an estimate of the trend in greenhouse gas fluxes directly attributable to agriculture and food production. Without this information, the SPM does not really provide a robust basis for the consideration of the adequacy of response measures. [, Australia]	This box has been removed. The information on trends in GHG fluxes has been included in the second draft - section A, and in Figure SPM 1. this includes additional information on trends related to agriculture and food production
33863	8	1	8	20	Box SPM.1: describes actual GHG fluxes in terrestrial ecosystem e. g., during 2007 to 2016. Please consider to illustrate a point of "expected GHG fluxes" if implementation of sustainable land management are achieved under different scenarios. [, Norway]	Future scenarios are now addressed in Figure SPM4
33865	8	1	8	20	Box SPM.1: On a first readthrough it is rather challenging to get all the nuances with the numbers presented in this very important box. It is not intuitively clear if it is e.g. only emissions, only sinks or net emissions, natural or anthropogenic sources that are presented in the different statements. Please consider to make this clearer by making a supporting table or a figure that can structure these numbers in an easier understandable way for readers. Some of the information provided here could also benefit from being mentioned earlier in the SPM, maybe in section A1.3 where the context seem to be relevant. [, Norway]	This box has been removed. The information on trends in GHG fluxes has been included in the second draft - section A, and in Figure SPM 1.
30347	8	1	8	22	Box SPM 1: be aware that policy makers are not very aware of different impact on global warming that different GHGs have. So explain well when talking about cumulative effects of GHGs or about shares/percentages of GHG subcategories like CO2 or CH4 only. [, Netherlands]	Noted and addressed in Version 2
22999	8	2	8	20	Box 1-3: It is difficult to understand the numbers and interpretation. Box 1.1 states net AFOLU emissions of 4.9GtCO2/y while Box 1.3 states net removals of 11.2 GtCO2/y. Both seem to refer to managed and unmanaged land emissions of anthropogenic CO2 but this is not entirely clear (one refers to AFOLU, the other seems to exclusively refer to unmanaged land). In consequence this means that currently land is globally a sink for CO2, which should be expressed more clearly; it is clearly stated in chapter 2 but not here. Overall a Figure or diagram showing the gas fluxes and net budget could be more helpful than reporting the quantities in text, only. [Anastasios Kentarchos, Belgium]	Noted, and addressed in the revised PSM section A

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23001	8	2	8	20	The GHG fluxes should be better presented, as the current sequence is confusing and potentially misleading. 1) A more logical sequence would present first the overall contribution of land, which is a big net GHG sink of CO2 and source of CH4 and N2O. 2) The above contribution could then be broken down to natural versus human-induced factors/components. 3) The human-induced component should be then disaggregated between direct and indirect components, clearly indicating where the effects of past management (a major factor for forest sinks) would fall. 4) Finally, the "expanded" impacts of the food system (beyond land use) should be presented. [Katherine Kosterkes, Belgium]	This box has been removed. The information has been presented in a more logical sequence in section A
24535	8	2	8	20	This is a very important box but it is quite confusing in what is included in different elements: Perhaps convert some of the data to a table and make the boundaries clearer on what is food, energy etc. [Ireland]	noted. Box has been removed and content revised.
24537	8	2	8	20	Some reflection on the balance of emissions and removals of CO2 and other gases would be useful here. [Ireland]	Accepted - included in revised SPM section A.
24539	8	2	8	20	Greater quantification of uncertainties and their scale at global levels would be useful here. This could point to other areas for development of further analysis [Ireland]	Accepted - uncertainties and ranges given where data is available
2999	8	2	8	20	In the Box SPM 1 (great synthesis!), it should be absolutely clear what type of emissions are assessed: net emissions or gross emissions. [Russian Federation]	Noted - this box has been removed
24229	8	2	8	20	Ranges reflected in Box SMP1 are relatively high, in particular when it come to the AFOLU part in the global GHG emissions (24% is too high), assuming that this include forest sink potentials. And 40% for the food system is as well too high, knowing very well that countries GHG inventories as well as IPCC guidelines don't have any food GHG emissions requirements. This box will just show a huge GHG mitigation potential that may be interpreted that food system and agriculture will require huge mitigation efforts, and hence businesses and markets expectations. [Kamal Djemouai, Algeria]	Text has been revised. Ranges are now better explained in SPM section A4
41717	8	2	8	20	The box has some difficult grammar. E.g., "12% of total anthropogenic CO2 emissions, mainly due to .." is confusing as to which the mainly refers. Simpler might be "2016. These emissions come mainly from deforestation... and constitute 12% of total anthropogenic CO2." Also clean up "Land is" since it is really ag practices among other things. "AFOLU is the major source methane emissions, [Michael Prather, United States of America]	Box removed, and content revised
2995	8	3	8	3	Are these 24% net emission from AFOLU? It is important to specify. [Russian Federation]	Accepted - has been spelt out
25879	8	3	8	4	This fig. is in box SPM1 and 2.4.4 lign 28, please precise the metrics used (GWP100?) and the date. [France]	Accepted - this has been spelt out in revised SPM section A footnote #5
15151	8	3	8	4	Fully support use of the term AFOLU, and its retention, in the event that there is any political objection to the term (as has sometimes occurred under the UNFCCC). Please retain. [Maya Hunt, New Zealand]	Noted - the term AFOLU has been retained
2991	8	3	8	5	How emissions of different GHGs are totalized? Using CO2 equivalent? It should be clarified. [Russian Federation]	Accepted, this has been addressed in the revised SPM section A.
26049	8	3	8	5	The term "fluxes" is not clear in this instance -- for example, it is not clear if we are talking about gross or net fluxes. Looking at Ch2 ES the statement is "contributing around 24% (medium evidence, medium agreement) of anthropogenic emissions". Suggest avoiding the use of the term fluxes. [Haroon Kheshgi, United States of America]	Noted. The term fluxes has been retained, but additional explanatory text provided.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
33867	8	3	8	9	Box 1.1: This gives very informative values. However we would like that you also give numbers for the most important source(s) for the AFOLU CO2 emissions e.g. from forestry, agriculture etc. Similarly as it is done for methane. [, Norway]	Accepted - now included in Figure SPM 1
1577	8	3	8	20	Global governments may collaborate more to reduce methane emissions from agriculture, landfills & biomass burning, to change the global food system (as per point A4.1. above) & alter global vegetation models too. [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	Noted
3413	8	3	8	20	The data in Box SPM 1 do not indicate their sources. The AFLOU data, which are multi-sourced and highly uncertain, involve sensitive factors such as agricultural emissions. Please check the data and provide their sources. [, China]	Line of sight has been addressed
24259	8	4	8	4	Why 24%? This is the old AR5 number referring to emissions in 2010. Is this number still referring to that year? If not, needs revision. Literature published after AR5 suggests the total percentage is more like 20% (Tubiello et al., 2015, GCB --cited elsewhere in this SR). [Francesco Tubiello, Italy]	Noted. Text in revised SPM Section A has been rewritten to provide greater clarity including contributions from different gasses
4871	8	4	8	4	It is not clear enough how the authors calculate the "total anthropogenic GHG emissions." Is it based on conversion with GWP or radiative forcing up to present, or something else? It would be appreciated if you would add some more explanation. [, Japan]	Accepted - this has been spelt out in revised SPM section A footnote #5
17555	8	4	8	4	Suggest amending "The fraction of greenhouse gas..." into "The fraction of anthropogenic greenhouse gas..." [, Sweden]	Text has been deleted
29243	8	4	8	4	I suggest you avoid using aggregated emissions and contributions to this. Thus, 24% contribution to total should not be used and rather split into contribution to total of each gas. [Jan Fuglestad, Norway]	Noted. Text in revised SPM Section A has been rewritten to provide greater clarity including contributions from different gasses
33473	8	4	8	5	What is the unit of total anthropogenic GHG emissions used here? The next sentence uses GtCO2/a, later TgCH4/a is another unit etc. It is necessary to make clear how these units are compared and use here best CO2-eq with a reference to the IPCC standard definition (incl. GWP). Since metrics are a cause of continuous and considerable debate within the UNFCCC (e.g. Plattner et al., 2009) this text needs to be very clear on the metrics. Cited References: ----- Plattner, G., Stocker, T., Midgley, P. & Tignor, M. (eds.), 2009. IPCC expert meeting on the science of alternative metrics. IPCC Working group I Technical support unit, University of Bern, Bern, Switzerland. Meeting Report , 82pp. http://www.ipcc.ch/pdf/supporting-material/expert-meeting-metrics-oslo.pdf PI022 [Andreas Fischlin, Switzerland]	Accepted - Units have been standardised.
30423	8	4	8	9	Box.1.1: it would be helpful to also express CH4 and N2O emissions in CO2 eq. [, Netherlands]	Accepted. Now included in Figure SPM 1
30425	8	4	8	9	It would be helpful to discern in the net LULUCF emissions, the gross emissions and the gross removals from different land use categories and important land use change categories like deforestation, forest land remaining forest land, reforestation, grassland, cropland, wetlands, settlements etc. [, Netherlands]	Accepted. Additional information provided in revised SPM section A4
12921	8	4	8	9	The aggregation of GHGs depends strongly on what climate metric is chosen for methane. The numbers here use the GWP100 which is around 28. Whereas choosing GTP100 (around 4) would give a different aggregate. I suggest reporting CO2, CH4 and N2O separately here rather than trying to combine them. [William Collins, United Kingdom (of Great Britain and Northern Ireland)]	Accepted - this has been spelt out in revised SPM section A footnote #5

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6107	8	4	8	20	In the Box SPM 1, at three time, we can see "Box 1.1", "Box 1.2" and "Box 1.3", please there is no need to add this precision; we can delete this items. [Jacques-Andre Ndione, Senegal]	Accepted
2997	8	5	8	6	12% of total NET emissions? [, Russian Federation]	Text deleted
17381	8	5	8	6	While net AFOLU emissions are 12% of total CO2 emissions the total gross AFOLU emissions are much higher indicating a higher mitigation potential than net CO2 flux figures suggest. This is particularly the case for e.g. wildfires. [Taehyun Park, Republic of Korea]	Thank you very much for your comment. The gross AFOLU emissions have been revised in the SPM final draft.
785	8	6	8	6	in this line, "y-1" is used for "per year", while in the rest of the document the unit is reflected as "yr-1". Action: change y-1 by yr-1 [, Spain]	Addressed in copy-editing
17557	8	6	8	6	Suggest amending "Land is a net source of methane..." into "Land use is a source of methane..." alt. "land use sector" [, Sweden]	Text deleted and revised. Additional explanation provided in revised SPM section A4
7711	8	6	8	6	(robust evidence, medium agreement) should be italic. [Hiroaki Kondo, Japan]	Addressed in copy-editing
31547	8	6	8	7	Box 1.1, fifth line: In many regions, land speculation is the main driver for deforestation and not the additional food production. Livestock is just the easiest way to land tenure. It is not really an intended increase of food production. In essence, it should not be even a food or agriculture issue. This context has been neglected by the reports, maybe even by the external scientific community that ignores the country's reality and take the premise that agricultural and livestock is the only driver for deforestation. Those emissions are really anthropogenic, and probably due to deforestation. But this reference to additional food production as the main driver should be removed. Reference example: de Oliveira Silva, R., Barioni, L. G., Hall, J. A. J., Matsuura, M. F., Albertini, T. Z., Fernandes, F. A., & Moran, D. (2016). Increasing beef production could lower greenhouse gas emissions in Brazil if decoupled from deforestation. Nature Climate Change, 6(5), 493. [, Brazil]	Box 1.1 has been removed and text has been revised. Deforestation and food production are addressed separately
3415	8	6	8	7	In "Mainly due to deforestation for additional food production", the expression and confidence of 'additional' here are inconsistent with those in the underlying report, which is suggested to be checked. [, China]	Text deleted and revised. Additional explanation provided in revised SPM section A4
25881	8	6	8	7	Is it "Land" or "Managed land"? [, France]	Noted. Text revised.
24663	8	6	8	7	Deforestation is also used for energy and other purposes [, Ireland]	Text deleted and revised. Additional explanation provided in revised SPM section A4
1685	8	6	8	7	human land is not clear [guosheng wang, China]	Additional clarifying text has been provided in revised SPM section A
32379	8	6	8	7	The statement that 12% of deforestation is caused by "additional food production" overlooks two dimensions, namely the differentiated impacts of different food production systems on deforestation (with labor intensive agro-ecological systems having least impact - the findings in Chapter 4, (4.10) and 5 (5.4.6), should be better reflected in this respect) and the differentiated impacts of different types of food on deforestation (see also Kaimowitz and Angelsen, 1998, Boucher et al., 2011): most deforestation is caused by meat and feedstock production, while additional plant-based food production has limited negative and sometimes even positive impacts on forests. [Simone Lovera-Bilderbeek, Paraguay]	Box 1.1 has been removed and text has been revised. Deforestation and food production are addressed separately
32497	8	6	8	7	Kaimowitz, D. and Angelsen, A., 1998. Economic models of tropical deforestation. A review. CIFOR, Bogor, Indonesia, 140 pp. [Simone Lovera-Bilderbeek, Paraguay]	noted

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32499	8	6	8	7	Boucher, D., Elias, P., Lininger, K., May-Tobin, C., Roquemore, S., and Saxon, E., 2011. The root of the problem, what's driving tropical deforestation today? Union of Concerned Scientists, Cambridge, USA, 126 pp [Simone Lovera-Bilderbeek, Paraguay]	noted
25883	8	6	8	8	The data leading to 61% come from table 2.2 which attributes them to the year 2012 and not to the period 2005-2015. [, France]	Noted. Underlying text in chapter 2 has been revised
14553	8	6	8	9	The text appears to be confusing anthropogenic and natural contributions to the methane flux. The text refers to land being a 'net source' of methane. This implies a net effect of sources and sinks. The only significant land sink of methane is the soil carbon sink, but this is a natural methane sink. The rest of the sentence discusses anthropogenic methane emissions. The sentence should be revised either to describe total (anthropogenic and natural) fluxes, or to focus on anthropogenic fluxes only. [, Canada]	Text deleted and revised. Additional explanation provided in revised SPM section A4
27583	8	7	8	8	Please check and harmonise the use of units and dimensions: In one paragraph you first use Gt for CO2 and then Tg for CH4 - this is quite confusing. [, Germany]	Addressed in copy-editing
32675	8	7	8	9	Tg units should be avoided in a SPM, as policy-makers are more used to tonnes [Jean-Pascal van Ypersele, Belgium]	Addressed in copy-editing
23003	8	8	8	8	specify agriculture: rice and livestock [Anastasios Kentarchos, Belgium]	Noted
25885	8	8	8	8	It is not clear how [137-140] is derived from the third column of Table 2.2. It seems that it comes from a combination of [100-112] with [25-39] which cannot lead to [137-140]. [, France]	Text deleted
8215	8	8	8	9	Could the figures for CH4 and N2O emissions also be given in Gt CO2-eq so it will be possible to compare with the CO2-emissions in line 5 and 15 [Harold Leffertstra, Norway]	Addressed in copy-editing
2993	8	9	8	9	It is expedient to unify units: either C and N, or CO2, CH4, and N2O. [, Russian Federation]	Addressed in copy-editing
20733	8	9	8	9	Can you add % for N2O please. [, United Kingdom (of Great Britain and Northern Ireland)]	noted - this has been addressed in the revised SPM section A4
25889	8	10	8	10	Would it be possible to have a figure for those numbers in box 1.1 and 1.2 ? For instance, it could be added and harmonised with the figure 1. [, France]	accepted - figure 1 has been comprehensively revised
25891	8	10	8	10	Does "also" mean that it is additional to AFOLU emissions (box 1.1) ? if yes, why forestry activities are included in food systems ? (on the other hand, especially when there is land use change, they can be linked...) It could be useful to be more explicit on the boundaries of the system (especially as adding 10% emissions within the farm gate and 10% from land use and land use change does not make 24% assigned to AFOLU in box 1.1) [, France]	Box 1.1 has been removed and text has been revised. Deforestation and food production are addressed separately
17559	8	10	8	10	Emissions that are attributable to food systems depend on system boundaries (for example, under which sector are transports included). UNFCCC and FAO, for example, can come up with quite different estimates for agriculture, for this reason. Difference in definition from other IPCC sectorial emission accounts, e.g. AR5/WGIII should be noted on here, for example with a footnote. [, Sweden]	accepted -additional explanatory material provided in figure SPM 1
25887	8	10	8	14	Even if TEEB study is addressed in the cross-chapter box 7 in chapter 7, a report on food and agriculture, TEEBAgriFood, have been released in 2015 (http://www.teebweb.org/publication/towards-teebagfood/). The finding of this report should be better reflected in the SRCCL. [, France]	Noted

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
27585	8	10	8	14	Please consider to adjust the categories used here to specify more clearly where, e.g., production of agricultural inputs is being counted, and how food loss is being included. As in table 5.2, it is surprising to see the high share of supply chain activities compared to land-related activities. It may be helpful to spell out the categories more clearly in order to avoid misunderstanding about the sources of GHGs in the food system. [, Germany]	noted
33869	8	10	8	14	Box 1.2: How are emissions from food system related to land use and land use change? Please consider to separate emissions and sinks from each sub-sector in AFOLU. [, Norway]	Section has been restructured and redrafted to clarify this
20735	8	10	8	14	When discussing the breakdowns of the 40% figure, it is not clear whether the 10%/10%/18% figures are referring to a percentage of the emissions attributable to food systems (leaving 62% unaccounted for), or to a percentage of total GHG emissions (leaving only 2% unaccounted for). Assuming the later, this could be clarified by adding 'with the remaining 2% corresponding to other sources' to the end of Box 1.2. [, United Kingdom (of Great Britain and Northern Ireland)]	Text deleted and revised. Additional explanation provided in revised SPM section A4
24773	8	10	8	14	These figures are of crucial importance and they should be highlighted more prominently in the SPM because land-based discussions are rarely discussed with the perspective of the entire food system [Viridiana Alcantara Cervantes, Germany]	noted
29245	8	11	8	11	I suggest you avoid using aggregated emission and contribution to this. Thus, 24% contribution to total should not be used and rather split into contribution to total of each gas. [Jan Fuglestvedt, Norway]	Addressed in figure SPM 1
7713	8	14	8	14	(medium confidence) should be italic. [Hiroaki Kondo, Japan]	Noted
30427	8	15	8	15	Box 1.3: Is this 11.2 Gt net removal/y about the climate impact of the 25% of unmanaged land as referred to A1.3? Or is it about an extra removal by that unmanaged land due to the effects of global change? Please explain [, Netherlands]	Noted - text in Box SPM1 had been deleted. Fluxes are now explained with greater clarity in revised SPM section A4
30429	8	15	8	15	Please explain the relation between the 12%/4.9Gt net CO2 emissions from AFOLU mentioned under Box 1.1 and the 28%/11,2 Gt net CO2 removals from global vegetation models in Box 3.1. [, Netherlands]	Noted - text in Box SPM1 had been deleted. Fluxes are now explained with greater clarity in revised SPM section A4
787	8	15	8	15	in this line, "y-1" is used for "per year", while in the rest of the document the unit is reflected as "yr-1". Action: change y-1 by yr-1 [, Spain]	Addressed in copy-editing
17155	8	15	8	15	"vegetation models estimate a net removal of CO2 of ~11.2 ± 3.0 GtCO2 y-1" : Labelling is misleading: is this CO2 removed from the atmosphere by the vegetation, or is this a decrease of the CO2 removed by the vegetation, and hence an increase in CO2 released in the atmosphere? If this is CO2 removed from the atmosphere, is it an increase of the CO2 removed, or is this the net total amount of CO2? From what I understand from this paragraph, 11.2 GtCO2 y-1 is the increase of the sink due to global change of unmanaged land, (hence a contribution to less CO2 in the atmosphere due to this negative feedback loop), but I'm not sure. Rephrasing would precise the meaning. [Renaud Toussaint, France]	Noted - text in Box SPM1 had been deleted. Fluxes are now explained with greater clarity in revised SPM section A4
14555	8	15	8	16	Isn't this the CO2 removal by all land, not just unmanaged lands? For example, I think this figure includes additional carbon absorbed by managed forests due the increase in atmospheric carbon dioxide. [, Canada]	Noted. Text revised.
15705	8	15	8	16	I don't understand this, please clarify. The value, 11.2 GtCO2y-1 is for the terrestrial ecosystem (i.e. managed land included), not for unmanaged land, whatever it means here. [Tuomo Kalliokoski, Finland]	Noted - text in Box SPM1 had been deleted. Fluxes are now explained with greater clarity in revised SPM section A4
20737	8	15	8	17	This is a bit confusing - sounds as if the total take up is the result of global change on unmanaged land. Presumably what you mean is that the total is higher than it would have been without CO2 fertilisation. [, United Kingdom (of Great Britain and Northern Ireland)]	Noted - text in Box SPM1 had been deleted. Fluxes are now explained with greater clarity in revised SPM section A4

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26079	8	15	8	17	This suggests that the effect of global climate change on unmanaged lands has been to increase carbon dioxide removal. If that implication is unintended, amend the sentence by replacing "due to the effects of global change on" with: "by" [Reid Detchon, United States of America]	Noted - text in Box SPM1 had been deleted. Fluxes are now explained with greater clarity in revised SPM section A4
32677	8	15	8	18	The second sentence seems to contradict the first one. They both need to be rewritten carefully. [Jean-Pascal van Ypersele, Belgium]	Noted - text in Box SPM1 had been deleted. Fluxes are now explained with greater clarity in revised SPM section A4
24407	8	15	8	19	We have the impression that there is enough evidence and agreement on the sentence : "Global vegetation models estimate a net removal of CO2 of ~11.2 ± 3.0 GtCO2 y-1 during 2007 to 2016 due to the effects of global change on unmanaged lands (removing around 28% of total anthropogenic CO2 emissions). Indicating (robust evidence, medium agreement) seems largely overestimated. The sentence is based on the results of models (See Ch2 p41) but most of them are biased because these models ignore the limitation to assimilation due to nutrients (N, notably but also P, K). The impact of CO2 fertilisation could be overestimated. Please check! [, Belgium]	Noted - text in Box SPM1 had been deleted. Fluxes are now explained with greater clarity in revised SPM section A4
23007	8	15	8	20	It is not correct to suggest that this removal occurs solely on "unmanaged land", as a very significant part of this sink occurs on land that is reported as managed (and actually subject to management). Therefore, it may also be incorrect to attribute these removals solely to climate change, CO2 and N fertilisation only, as it is likely to be affected by current and/or past management practices, e.g. the recovery of forest from past management, which has been a very important factor on a century timescale in temperate and boreal forests. The uncertainties about the future development of this land sink includes the future intensity of management. [Anastasios Kentarchos, Belgium]	Noted - text in Box SPM1 had been deleted. Fluxes are now explained with greater clarity in revised SPM section A4
33871	8	15	8	20	Box 1.3: Consider including both emissions and sinks in addition to net removal of CO2. [, Norway]	Noted - text in Box SPM1 had been deleted. Fluxes are now explained with greater clarity in revised SPM section A4
29631	8	15	8	20	This is useful information, but it should be made more clear that this is referring to CO2 flows that are not directly caused by humans (see the definition of CDR in the SR1.5, which excludes CO2 uptake not directly caused by humans) [, Saint Lucia]	Noted - text in Box SPM1 had been deleted. Fluxes are now explained with greater clarity in revised SPM section A4
789	8	15	8	22	this paragraph does not include any confidence level. Either it is added or the paragraph should be deleted. [, Spain]	text revised
2137	8	16	8	16	It is worth noting that the distinction between managed and un-managed lands is increasingly tenuous. [David Kaimowitz, Nicaragua]	Additional clarifying text has been provided in revised SPM section A4
25893	8	16	8	16	The expression "due to the effects of global change on unmanaged lands" is not correct since the change from the past is mainly due to the increase in CO2 concentration in the atmosphere (Ch.2, pp 41, line 9). We suggest to replace the expression with "due to the indirect effects of environmental change" as in Ch.2 pp 40 line 34. [, France]	text deleted
17561	8	16	8	16	Is "global change" meant, or "climate change"? [, Sweden]	text deleted
8581	8	16	8	16	The fact that net removal of CO2 is due to the effects of climate change is not so evident to me. This affirmation is based on the results of models (See Ch2 p41) but most of them are biased because they ignore the limitation to assimilation due to nutrients (N, notably but also P, K). The impact of CO2 fertilisation could be overestimated. [Marc Aubinet, Belgium]	noted
29903	8	17	8	19	This sentence in BOX 1.3 is very difficult to understand and possibly incorrect. How can climate change cause net removal of CO2? Also CO2 and N fertilisation impacts are given as one of the main drivers of negative land emissions. That is overly optimistic. If the fertilisation effect is mentioned then it's contribution has to be quantified. Also the following sentence highlights uncertainties related to the CO2 fertilisation. [, Estonia]	text deleted - redrafted in section spm A4

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17563	8	19	8	19	What do such projections indicate about the future land sink? Please complete, as appropriate. [Sweden]	Future implications addressed in revised SPM section A6
29905	8	19	8	20	Add evidence/confidence/agreement levels. [Estonia]	noted
17383	8	34	8	39	Having comparisons with other projections such as s 2oC, 3.1-3.5oC would be beneficial. 1oC gap is simply not granular enough as the IPCC SR15 was clear of the difference every 0.1 oC makes holistically [Taehyun Park, Republic of Korea]	noted
40385	8		8		Example of a box where information on recent trends and new knowledge since AR5 would be relevant. [Valerie Masson-Delmotte, France]	noted
15879	8	4			it is not forestry per se, but the consequence of deforestation which is really not the same! or may be they count evapotranspiration flux in GHG?? [Caroline Vincke, Belgium]	Noted. Revised text in section A has been clarified
16431	8	5			Italic inside (), please check the rest also. [Republic of Korea]	noted - Addressed in copy-editing
16433	8	8			yr-1 or y-1, be consistent. [Republic of Korea]	Addressed in copy-editing
23005	8	11			The authors suggest that the global food system contributes to ca. 40% of global GHG emissions. That is very high compared to IPCC (2014). The basis for this high value seems to be the assumption that 18% are derived from storage, processing, transport, retail, and other supply chain activities. The consistency (or not) of figures in the different sub-boxes needs to be explained. Box 1.1 suggests AFOLU comprises 24% of total GHG emissions. Box 1.2 suggests food (less processing etc) comprises 28%. This value is also inconsistent with the previous statement because typically direct emissions related to crop and livestock production include energy-related emission from fertilizer and pesticide production and emissions from farm machinery. Typically, ca. 15% of food system emissions are associated with pre- and post-harvest processing, retail, storage, and transport. The numbers in the chapter (5) are not well documented. In this context it would be worth considering if energy used for cooking should not be addressed here. This is important for food security, particularly in low-income countries, and, where biomass energy provides a large part of the fuel used for cooking, there is a strong connection to land degradation and opportunities for mitigation. The box should also consider how the categorisation of emissions related to food and AFOLU compares to the categories used for national GHG inventories. [Anastasios Kentarchos, Belgium]	Section has been restructured and redrafted and revised SPM headline statement B4 to clarify this
38273	8	15			In Box SPM.1, change 'per year' units to be consistent with rest of document. [United States of America]	accepted
38275	8	16			Currently reads, "In recent decades, climate change, enhanced vegetation growth from rising atmospheric concentrations of CO2 and nitrogen availability as well as changes in soil processes resulted in the net land removal of CO2 from the atmosphere." This sounds as though there is a NET removal of CO2 from the atmosphere, but the point is really that the land is a net sink instead of source. Rephrase so that it doesn't sound like atmospheric CO2 has gone down in that time period. Maybe change to say, "In recent decades, climate change, enhanced vegetation growth from rising atmospheric concentrations of CO2 and nitrogen availability as well as changes in soil processes resulted in land removal of CO2 from the atmosphere exceeding (non-combustion) land emissions." Or something to show that the land sink isn't greater than fossil-fuel based human emissions. [United States of America]	text deleted - redrafted in section spm A4
15881	8	19		20	ok!But I would add "...soil nutrient availability, microbial processes, and their interactions, are the... [Caroline Vincke, Belgium]	noted - section rewritten

IPCC SRCCL Second Order Draft Review Comments and Responses - SPM

Comment No	From Page	From Line	To Page	To Line	Comment	Response
5307	8				Box SPM 1: It is noted that this box omits quite relevant information included in the executive summary of chapter 2. It is suggested to include either a link to this part in the box or to include the most relevant information, e.g. the language in bold of the executive summary. [Klaus Radunsky, Austria]	Noted. Text revised and incorporated in Sections A and B of the SPM final draft.
41719	8				Box1.2 shorten sentences: "...transportation. In aggregate..." LateDrop "This estiamt" for "The major components are crop and livestock..(10%, range 7-13%), LULUC...peatland (10%, 5-14%), and storage, proc... (18%, 16-20%). [Michael Prather, United States of America]	Section has been redrafted
41721	8				Box 1.3 drop the '~' since you give 3 places, that is the accuracy, it is not 'approximately 11.2...' [Michael Prather, United States of America]	noted
17795	8				This box contains very useful information but as it covers the emissions from agriculture and the food supply chain, its title is not appropriate [Quentin Lejeune, Germany]	Box has been removed. Content now included in section A4-6
4233	8				Box needs the uncertainties italicised. Is confusing using Gt and Tg in same paragraph- Box 1.1. Change Tg to Mt [Ralph Sims, New Zealand]	Addressed in copy-editing
15313	9	1	9	1	Suggest reviewing the level of risk for 'land degradation', currently there appears to be less risk than for all the components that have been separately identified. [, Australia]	Noted. The judgments on risk transitions. {7.3, Chapter 7 Supplementary Material} was further developed and updated since the last draft. Note also that the summary bars do not appear in the updated figure.
3335	9	1	9	1	In order to be clearer, please, to clarify if fire is referred to bushfires and if water scarcity is related with fresh water availability for human being [, Mexico]	Noted. Fire has been relabelled as wildfire damage in the updated version of SPM3 (now SPM2)
38277	9	1	9	1	The Coastal Erosion and Vegetation Changes embers don't appear to match those in Figure 7.1. [, United States of America]	Noted. The embers have been redrawn and those in the chapter now match those in the SPM figure (now SPM2)
33475	9	1	9	7	What are vegetation changes? Unclear whether you refer to range shifts or other changes. [Andreas Fischlin, Switzerland]	Noted. Vegetation changes has been relabelled - vegetation loss.
4191	9	1	9	7	In the legend for the figure SPM 3a it should say: "the grey horizontal bar is a...", Similarly, connecting arrows at the bottom of the figure should be bolder. [Eugenia Gayo, Chile]	Partially accepted. The horizontal grey bar has been relabelled, while the interconnecting arrows have been replaced with a new visualisation which is labelled according to the 'human systems at risk'.
24541	9	1	9	7	Data should be aligned with SR1.5. Unclear how well issues are defined and of direct relevance for the Report; consider more concise figures that address climate and land issues [, Ireland]	Partially accepted. Care has been taken to align the figure better with SR1.5. More specificity has been added to the embers included in the figure and their implications for 'human systems at risk'.
24665	9	1	9	7	Use the term 'food security' rather than insecurity [, Ireland]	Noted. The term food insecurity has been replaced with food security in the introductory text in the updated figure. However the term food insecurity is retained in the panel on socioeconomic pathways as this is reflective of the risk as a function of GMST in that context.
24667	9	1	9	7	These figures are complex and may lose value with the range of detail provided. Consider alternatives for some material [, Ireland]	Noted. The figure (SPM3a and b) have been redrawn with care taken to simplify the visualisation and more clearly indicate the differences between the panels depicting risk as a function of GMST and as a function of Land use.
3001	9	1	9	7	The use of burning embers for the purpose of this report can be misleading. Yes, additional risk can be detectable and attributable, but SMALL! [, Russian Federation]	Many thanks for the comment. The risks detailed in this report have complex methodologies, which are further described in Chapter 7. Burning embers nevertheless remain important because they can be used to highlight risks, not only from climate hazards but from our responses, including mitigation and adaptation.
3907	9	1	9	7	Figure SPM 3a should contain an additional column on the risks on Human Settlements. [, Switzerland]	Accepted. The updated figure includes 'Infrastructure' as part of the human systems at risk.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
20741	9	1	9	7	It is unclear how the overall measure of desertification, land degradation and food insecurity risks have been derived. Do these represent an aggregated picture, or do they use a single representative indicator (e.g. coastal erosion for land degradation, as in Figure SPM3b)? This should be clarified in the caption. [United Kingdom (of Great Britain and Northern Ireland)]	Noted. The aggregated embers (Desertification, Land degradation and food insecurity) have been removed from the figure (previously SPM3 a)
6109	9	1	9	7	It would be better to put this figure SPM3a in landscape position for better visibility [Jacques-Andre Ndione, Senegal]	Noted. Figure SPM3 (now SPM2) has been redrawn specifically to suit portrait orientation.
15247	9	1	9	7	The warming level of present-day should be consistent with SR1.5 [Zhai Panmao, China]	Accepted.
38279	9	2	9	2	Define the baseline for the warming differentials shown on the y-axis (warming since preindustrial time?). [United States of America]	Accepted. This has been updated to 'Global mean surface temperature change relative to levels in pre-industrial time (°C)' in the new version.
5309	9	2	9	2	Figure SPM 3a: The first sentence should be reworded in order to add clarity: The grey line (0.87oC) describes the current global mean surface temperature change compared to the preindustrial level. [Klaus Radunsky, Austria]	Noted. This has been updated.
6853	9	2	9	2	The color patterns make it difficult to discern the differences in the risk level between the different component. Consider other design. [Markus Giger, Switzerland]	Noted. The colour pattern has been professionally designed (in line with SR1.5) in the updated version of the figure.
17385	9	2	9	2	This summary of risks should have included risks to ecosystem services beyond food security and risks to biodiversity. [Taehyun Park, Republic of Korea]	Noted. In the updated figure 'human and ecosystems health' is used as part of the systems at risk.
24409	9	2	9	6	SPM 3A and SPM3B : please double check that there is no observed impacts for fires, coastal erosion, vegetation changes, and only a very limited impact that can barely be seen as yellow for desertification. The current figure suggests that there is nothing that was already attributable to CC in the recent past regarding those impacts, this does not seem obvious. [Belgium]	Accepted. The variables included in this version of the figure are dummy variables. Data, and colours, have been updated now that the consensus process for judgements is complete.
24411	9	2	9	6	SPM 3.A "moderate" is not so understandable. The land degradation is due to different causes (warming, population, land use, land management etc.) How relevant is this risk assessment linked to surface temperature only? [Belgium]	Noted. The judgments on risk transitions was further developed and updated since the last draft {7.3, Chapter 7 Supplementary Material}. The updated figure (SPM3A) shows the interconnected nature of categories in terms of risk to human systems
13427	9	2	9	7	Figure SPM 3a gives the impression that the risk of desertification increases faster than that of land degradation. Is desertification not a form of land degradation? [Lourdes Tibig, Philippines]	Noted. In the context of SRCCL desertification is dealt with separately to land degradation in accordance with the approved report outline. Please refer to Ch3 and Ch4 for detailed definitions of both.
13111	9	3	9	3	0.87 degC -- what is the baseline? Is this standard? [David Cooper, Canada]	This is the estimated GMST increase since preindustrial times.
14557	9	3	9	3	Clarify that 0.87C is the warming to 2006-2015 relative to the 1850-1900 base period (SR 1.5). Observed warming for the most recent years is higher than this. [Canada]	Correct. We are using the 2006-2015 warming relative to 1850-1900, and not including warming from recent years.
26029	9	3	9	3	The present day warming was estimated to 1.0°C in the Special Report 1.5°C. 0.87°C corresponds to the warming for the decade 2006-2015 which is not the present day. [France]	Noted. However the value used in this figure is consistent with that of the burning embers figure of SR1.5 (SPM2) which also uses the reference period of 2006-2015 as 'present day' which has a mean warming of 0.87°C global mean surface temperature change relative to levels in pre-industrial time (1850-1900).
38281	9	3	9	3	A confidence interval should provided for this value. What is "present day" defined as? What is the time period over which the temperature is averaged, relative to what? [United States of America]	This figure uses a present day warming reference period of 2006-2015 which has a mean warming of 0.87°C Global mean surface temperature change relative to levels in pre-industrial time (1850-1900).

IPCC SRCL Second Order Draft Review Comments and Responses - SPM

Comment No	From Page	From Line	To Page	To Line	Comment	Response
20745	9	3	9	7	These are risks *from* components of desertification. Also, this conflates risk and hazard. Nutrition and yield are factors *at risk from* desertification and land, whereas permafrost degradation, fire and coastal erosion are *hazards relating to* desertification and land degradation. Please be consistent with treatment of risk in other IPCC reports (especially SR1.5 and SROCC) as well as retain consistency with the risk literature. [, United Kingdom (of Great Britain and Northern Ireland)]	Noted. In line with SR1.5 and SROCC the figure has been redrawn and now specifically includes links between changes to biophysical processes to the Human systems at risk.
23009	9	6	9	6	The figure refers to the level of additional risks posed by climate change - unclear what this is compared to [Anastasios Kentarchos, Belgium]	Noted. The figure and caption have been revised. The first panel of the updated figure focuses on the impact of climate change on risk, under present-day exposure and vulnerability.
31831	9	6	9	6	two full stops after change [Samantha Grover, Australia]	Noted, the caption has been revised.
17565	9	7	9	7	Which previous IPCC report? [, Sweden]	Noted, the caption has been revised.
31833	9	7	9	7	"report" should be "reports" and add spaces between 3,4,5,6 ie 3, 4, 5, 6 [Samantha Grover, Australia]	Noted, the caption has been revised.
29907	9		9		Figure SPM 3a - risks on permafrost - the burning ember shows that at the current warming there are no risks. Yet we see clear evidence of damages - methane holes (that cause damage to reindeer herds) in tundra and drunken trees in taiga and increased release of methane from permafrost thawing. There are Nature articles on climate change impacts on permafrost. Please revise this figure to reflect the reality. Also ensure coherence with SROCC. [, Estonia]	Noted. The judgments on risk transitions was further developed and updated since the last draft - full details provided : Section 7.3 and Chapter 7 Supplementary Material.
33873	9		9		Figure SMP 3a: The probability of fire incidence is also high in (semi)-arid ecosystem. Please consider to evaluating food security with respect to standard criteria, such as food availability, accessibility and utilization/adequacy in addition to nutrition. Sometimes yield or food sufficiency does not imply food security. [, Norway]	Noted. In the updated figure (previously SPM3A) the summary embers have been removed. We note that the figure text now indicates clearly that 'Changes in one process (e.g. fire or water scarcity) may result in compound risks. Risks are location specific and differ by region.' Due to space limitations it was not possible here to show embers for each category by region.
33875	9		9		Figure SPM 3a: Desertification is a part of land degradation in arid and semiarid environment. In stead of classifying as an independent factor desertification, consider the term (1) land degradation in arid and (2) land degradation non-arid environment. [, Norway]	Noted. The summary embers in the previous SPM3a have been removed. Further to that, in the context of SRCL desertification is dealt with separately to land degradation in accordance with the approved report outline. Please refer to Ch3 and Ch4 for detailed definitions of both as applied in this report.
11643	9		9		add a time frame for "present day" people will be using this graph well through the coming 5 years [Linah Ababneh, Sweden]	Accepted.
30825	9		9		Figure SPM 3a seems to me to underplay risks of fires, coastal erosion and vegetation change at present levels of warming – they are not undetectable as the figure indicates, they are a present risk now with actual impacts happening. [Mike Morecroft, United Kingdom (of Great Britain and Northern Ireland)]	Noted. The judgments on risk transitions was further developed and updated since the last draft - full details provided : Section 7.3 and Chapter 7 Supplementary Material.
4873	9	0	10	0	For Figure SPM 3a and 3b, please indicate the time scale of present day for the estimate. [, Japan]	Accepted.

IPCC SRCCL Second Order Draft Review Comments and Responses - SPM

Comment No	From Page	From Line	To Page	To Line	Comment	Response
3417	9	1	10	8	<p>Figures SPM 3a and 3b are inconsistent, with the former dealing with desertification, land degradation and food insecurity, and the latter only land degradation and food insecurity without desertification, which is suggested to be checked.</p> <p>Some types listed in Figure SPM 3A overlap with each other, such as soil erosion, which should be included in land degradation or desertification. So it is suggested to supplement the relationships among the items listed in the figure.</p> <p>“The grey line (0.87°C) is a measure of the extent of present day warming.” (line 3, page 9). According to the latest conclusion made in the IPCC Special Report on 1.5°C, the temperature has risen by about 1.0°C. So it is suggested to update the conclusion and supplement it with the expression of confidence. [, China]</p>	Partially accepted. Figure SPM3a and SPM3b (now SPM2) have been revised. In the Second panel (showing risk related to socioeconomic pathways) now includes Desertification, land degradation and food insecurity. The relationships between the embers in SPM3a have been revised and now reflect the interconnectedness of these types. The grey line indicating present day warming has been updated to be consistent with the SR1.5.
27587	9	1	10	8	<p>Figure SPM3:</p> <ul style="list-style-type: none"> - Please consider adding "change" to the description of the grey line in figure (a) as you probably refer to the mean temperature change and not the mean temperature. - You might consider changing the order of the pillars in figure (a): it would improve understanding if the different components would follow directly to the aggregated pillars. - You might consider cutting off figure (a) at 3.5 or 4°C, as the dilation of the most interesting part of the pillars between 1.5° and 3° would increase the meaning of the figure. - Most RFCs look so similar that one almost thinks there is no difference. Please revise the colours. - The SR1.5 RFC/figure states that current temperature increase is at about 1C. Please harmonize. [, Germany] 	Noted. The order of the pillars has changed and the aggregated pillars have been removed. Also, the colour bars/ transitions where based on dummy variables and have been updated with correct numbers based on the finalized consensus process. We cut the scale in two of the panels but not on panel a) as we would like to be comparable with previous burning embers in other reports.
20739	9	1	10	8	<p>The caption to Figure SPM 3a states that the grey line, corresponding to 0.87C is a measure of the extent of present day warming. The Special Report on 1.5°C states that this temperature is the observed global mean surface temperature for 2006-2015, which does not correspond to present-day warming. Therefore the caption should either reflect the true derivation of that temperature, or the grey line should be moved upwards to 1.0C, which the Special Report on 1.5C identifies as the current level of global warming. [, United Kingdom (of Great Britain and Northern Ireland)]</p>	Accepted. The grey line has been updated to show Global mean surface temperature change relative to levels in pre-industrial time (°C) for the period 2006 - 2015, and harmonised to show current temperature increase as per the SR1.5.
20743	9	1	10	8	<p>The colours used to represent level of risk should be harmonised with those agreed on in other IPCC reports, most recently the Special Report on 1.5°C. For example, in that report, purple indicated the presence of significant irreversibility or persistence of climate-related hazard. It is unclear whether it also indicated irreversibility / persistence in this report. [, United Kingdom (of Great Britain and Northern Ireland)]</p>	Accepted. The colour scheme has now be applied using the same scale as used in the Special Report on 1.5°C.
1579	9	2	10	8	<p>The figures quoted here appear scary. Global governments might benefit from publicizing the risks shown more, i.e. from increased desertification, and risks arising from more human migration & conflict, plus those from how the expansion of drylands effects water shortages. Human populations in dryland areas may need greater protection and humanitarian assistance from the UK government regarding desertification, droughts & heatwaves, notice of food & water security issues, and possible negative human health impacts arising, e.g. respiratory & cardiovascular illnesses, plus over competition for land, e.g. across the Sahel region. [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]</p>	Noted. The figure has been revised and redrawn.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
8751	9	2	10	8	Additional detail is needed in SPM 3a and 3b on how the authors when through the process of determining expert judgment and the number of experts that contributed to these figures. [Jean-Luc Chotte, France]	Noted. The judgments on risk transitions was further developed and updated since the last draft - full details provide : Section 7.3 and Chapter 7 Supplementary Material.
21855	9		10		Figs SPM 3a and 3b: Please, consider adding uncertainty estimate to the "present day temperature" and revising term similar to SR15. [, Finland]	Noted. However the value used in this figure is consistent with that of the burning embers figure of SR1.5 (SPM2) which also uses the reference period of 2006-2015 as 'present day' which has a mean warming of 0.87°C global mean surface temperature change relative to levels in pre-industrial time (1850-1900).
6333	9		10		This is a very valuable figure as it presents the clear linkages between warming and impacts on land and builds upon SR1.5. [, Gambia]	Noted.
20747	9		10		Include confidence statements for the transitions between colours on each bar, as in the Reasons for Concern figure in SR1.5. [, United Kingdom (of Great Britain and Northern Ireland)]	Accepted.
20749	9		10		Figure 3a three lefthand side bars - which SSP is this? Are these different to panel b? Consider combining these two elements to clarify the figure. [, United Kingdom (of Great Britain and Northern Ireland)]	Noted. The summary bars shown in SPM3A have been removed from the updated figure. We note also that in the updated figure the embers (previously SPM3A) focuses on the impact of climate change on risk, under present-day exposure and vulnerability.
20751	9		10		The key on the RHS should include the descriptors for purple, red, yellow, white to be consistent with SR1.5 and SROCC. Otherwise it's not really clear what "high", "very high" refers to. [, United Kingdom (of Great Britain and Northern Ireland)]	Noted. The legend has been updated accordingly.
20753	9		10		Panel A appears to conflate risk with hazard. For example, the far right bar (water scarcity) appears to just show that water scarcity (in some regions presumably given that other regions will not experience this?) will increase with increasing temperature, which doesn't require a large figure to demonstrate. A more policy-relevant analysis would consider the populations or systems that are exposed to or vulnerable to water scarcity (for example), so perhaps a synthesis of risks for key systems would be more useful (see the second panel in the Reasons for Concern diagram for SR1.5) [, United Kingdom (of Great Britain and Northern Ireland)]	Noted. The figure has been updated and now includes interlinkages between the embers and risks to food systems, livelihoods, infrastructure, the value of land and human and ecosystem health.
20755	9		10		What is the standalone "food insecurity" bar in panel B? Should biodiversity and other factors also be represented here?; [, United Kingdom (of Great Britain and Northern Ireland)]	Noted. The standalone ember on food security has been removed from the updated version of the figure,
30705	9		10		This is a very valuable figure as it presents the clear linkages between warming and impacts on land and builds upon SR1.5. [, United Republic of Tanzania]	Noted.
17797	9		10		This is a useful figure, providing continuity from SR1.5. However, the figure is not clear in how it deals with different land use scenarios. There are many ways land use and land use change could look like for a given degree of global warming. It would be helpful if Figure 3a could specify what socio-economic / LULUC assumptions it is based on, or how socio-economic effects are taking into account. Figure 3b is helpful in this respect because it tries to account for both the LULUC and global warming dimensions. [Quentin Lejeune, Germany]	Figure A assumes current level of socio-economic trends and land use. In other words, is shows only the impact of changes in biophysical drivers. These drivers should be considered proxies for risk. Figure b indicates the impact of different land use scenarios and climate change on risk. It thus shows that socio-economics play a role in risk. We do not have a figure solely for socio-economics due to space limitations.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
40387	9		10		This assessment of changing risk needs full traceability to the assessed literature (in chapter 7 annex and other chapters, exact sections) and to report the level of sc. Understanding / confidence. Note that SSP scenarios are not introduced in the corresponding text. [Valerie Masson-Delmotte, France]	Accepted. The figure has been revised. For all: As in IPCC SR1.5, AR5 and O'Neill et al. (2017), literature was compiled, and data extracted into a summary table. A formal expert elicitation protocol, based on the modified-Delphi technique and the Sheffield Elicitation Framework, was followed to develop threshold judgments on risk transitions. {7.3, Chapter 7 Supplementary Material}. The SSP scenarios are introduced in the figure annotation and also in Box7A in the revised SPM text.
25895	9	1			"We suggest to refer to food security whose definition is agreed by FAO and the Committee on Food Security. This would imply in the SPM figures to refer to "impacts on food security" instead of "risks of food insecurity". We appreciate that the SPM uses the burning embers diagram to express the risks to be faced for some aspects related to land. Most readers of IPCC reports are now well familiar with this kind of representation which was introduced in links with the main five reasons for concern. Therefore we draw the attention of the authors on the fact that SPM3-a and SPM3-b use the burning embers to describe the levels of "risks of" specified processes (desertification, food insecurity, ...) and not the "impacts and risks for" systems as in the SR1.5 SPM. In our opinion, the term "risk of" describes a probability of occurrence. We advise the authors to consult the communication experts of the IPCC secretariat and TSUs to verify the consistency of this new way of using burning embers with the traditional way. [, France]	Noted. The figure has been redrawn and the caption updated. In the new version panel A now shows risks to selected elements of the land system as a function of global mean surface temperature, and their interconnection to broader human and ecological systems (food supply, human and ecosystem health, livelihoods, value of land, and infrastructure). The 'food insecurity' has been replaced with a 'Food system stability' ember in Panel A. We note also that the framing of 'risk' has been updated in the new version.
26027	9	1			For all components risk is considered as "high" as soon as the change in temperature passes 2°C unless for soil erosion. As water regimes will change erosion is also expected to increase and according to the figure this only is expected to be highly risky between +3 to 4 °C. Is it possible to explain why ? Furthermore, if the erosion quotation changes it will also impact land degradation. [, France]	Noted. The judgments on risk transitions. {7.3, Chapter 7 Supplementary Material} was further developed and updated since the last draft. The updated figure shows the interconnected nature of categories in terms of risk to human systems. Note also that the summary bars in the previous SPM3A do not appear in the updated figure.
27589	9	1			Figure SPM.3: Please provide an explanation for the RFC as in the caption of SR1.5 SPM Figure 2. Please specify whether the figures indicate the risk OF a certain issue (desertification, LD, food insecurity etc.) TO PEOPLE due to temperature rise, or if they indicate the risk OF temperature rise TO AMPLIFY a certain issue. [, Germany]	Accepted. Caption has been updated. As in the 1.5 report the figure indicates the implications of global warming for people, economies and ecosystems.
23253	9	1			The inclusion of this figure is welcome. However, I note that the 'Land degradation' summary bar looks very similar to the 'Soil Erosion' bar whereas the other six bars that make up the land degradation bar are much 'riskier'. This does not seem consistent. [Mark Howden, Australia]	Noted. The judgments on risk transitions. {7.3, Chapter 7 Supplementary Material} was further developed and updated since the last draft. Note also that the summary bars do not appear in the updated figure.
29633	9	3			The degree of present-day warming is for the decade 2006-2015 (A1.1 of SR1.5), rather than the 30 year average cited in A1 of SR1.5. Consistency with SR1.5 would be useful, as would an explanation of how it is calculated. [, Saint Lucia]	Noted. However the value used in this figure is consistent with that of the burning embers figure of SR1.5 (SPM2) which also uses the reference period of 2006-2015 as 'present day' which has a mean warming of 0.87°C Global mean surface temperature change relative to levels in pre-industrial time (1850-1900).
13429	9	3			Why 0.87°C? What is the basis of this measure of the extent of present day warming? [Lourdes Tibig, Philippines]	This figure uses a present day warming reference period of 2006-2015 which has a mean warming of 0.87°C Global mean surface temperature change relative to levels in pre-industrial time (1850-1900).
4235	9	7			Authors of which chapter? [Ralph Sims, New Zealand]	Noted, the caption has been revised.
7435	9	7			please write "IPCC reports" [tarig Ibrahim, Sudan]	Noted, the caption has been revised.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
15953	9				Fig SPM3A "moderate" is not so understandable. The land degradation is due to different causes (warming, population, land use, land management etc etc..) How relevant is this risk assessment linked to surface temperature only? [Caroline Vincke, Belgium]	Noted. The narratives in chapter 7 detail the different contributing factors to risk (temp change, land management, etc). The land degradation ember has been removed and only several biophysical drivers that are proxies for risk remain in the revised figure.
26233	9				Figure SPM 3a: Please add lines for each half degree of warming to the diagram [, Luxembourg]	Partially accepted; there was only space to add one additional line at 1.5°C which is included in the redrawn figure.
26235	9				Figure SPM3a: Please also add grey bars for the level of warming for each RCP scenario [, Luxembourg]	Rejected. In order to keep the visualisation simple this was not possible. However an additional line indicating 1.5°C was added.
5311	9				Given the significant dependence of the level of risk from the socio - economic pathway (as highlighted in figure SPM 3b) it seems important to specify the SSP that has been used in assessing the level of risk as indicated in figure SPM 3a. [Klaus Radunsky, Austria]	Noted. SPM3a (now panel 1 in SPM2) focuses on the impact of climate change on risk, under present-day exposure and vulnerability.
41723	9				A tough figure, change "this chapter" to "the SPM" and drop lower panel unless combine figures [Michael Prather, United States of America]	Noted. The figure and caption have been revised.
30059	10	1	10	1	It is very counter-intuitive that 'expert judgement' (as indicated in the caption) comes to the conclusion that a 3.5 degrees temperature rise in SSP 1 does only result in a 'moderate' food insecurity, especially in combination with 'land degradation' being 'high' (it is also counter-intuitive that land degradation is equal in both SSP1 and SSP3). It really needs some explanation, maybe in a box. Also, it might be indicated that the world as it is right now is not consistent with SSP1. [, Netherlands]	Noted. SSPs are now explained in the SPM text: BOX A7: Shared Socioeconomic Pathways (SSPs), we note also that the judgments on risk transitions for the burning embers were further developed and updated since the last draft - full details provided : Section 7.3 and Chapter 7 Supplementary Material.
33877	10	1	10	1	Please give some more information about the socioeconomic pathways (SSP 1-3) used in figure SPM3b - e.g. consider including a box to expand on these pathways [, Norway]	Noted. SSPs are now explained in the SPM text: BOX A7: Shared Socioeconomic Pathways (SSPs)
38283	10	1	10	1	More detail is needed on the different socio-economic pathways depicted in Figure SPM.3b. [, United States of America]	Noted. SSPs are now explained in the SPM text: BOX A7: Shared Socioeconomic Pathways (SSPs)
38285	10	1	10	1	The SSP 3 ember for land degradation and the SSP 2 ember for food insecurity don't appear to match those in Figure 7.2. [, United States of America]	Noted. The updated figures now match between chapter and SPM. However the figure is split into sections in Ch7 as this was more appropriate in that case.
24233	10	1	10	1	Please correct in the standalone food insecurity graphic the word "achieve". [Kamal Djemouai, Algeria]	Noted, the caption has been revised.
29739	10	1	10	1	Figure SPM-3(b). The SSPs have not yet been introduced in this SPM, at this stage, and so may not make sense, out of context, to the reader who has not been exposed to them in other IPCC reports. Consider where you place this graphic and how you explain/contextualise it. [Mairi Dupar, United Kingdom (of Great Britain and Northern Ireland)]	Noted. SSPs are now explained in the SPM text: BOX A7: Shared Socioeconomic Pathways (SSPs)
17157	10	1	10	1	Food insecurity figure, labelling of the ordinate axis: "to achieve" -> "to achieve" [Renaud Toussaint, France]	Noted. The axis labels have been redrawn.
17159	10	1	10	1	Food insecurity figure: the meaning/general interpretation of the data represented on this figure should be explained: does it show that when mitigation measures are more land-based than other forms of mitigation, the food insecurity increases? Is that because some land is used for non food production purposes, and rather reallocated to other uses to mitigate the warming - like e.g. planting trees? That's what this figure seems to imply, but I'm uncertain about the interpretation. [Renaud Toussaint, France]	Noted. This part of the figure has been completely revised and now shows 'The amount of land used for bioenergy crops in 2050 under a 2°C warming target affects risks related to food systems, terrestrial ecosystems and water scarcity, assessed here as a combined risk.' Assessment is shown for two SSP's.
14495	10	1	10	1	May need A) Land degradation B) Food insecurity [Shuzo Nishioka, Japan]	Noted. The layout of the figure has been revised with annotations and headings on the figure for each section.
30431	10	1	10	3	The SSPs should be explained. There is no reference to literature. [, Netherlands]	Noted. SSPs are now explained in the SPM text: BOX A7: Shared Socioeconomic Pathways (SSPs)

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25141	10	1	10	8	Coastal erosion does not seem to be an adequate indicator for land degradation in general. Soil erosion or a combination of indicators would be more appropriate [Alexander Erlewein, Germany]	Noted. The summary bars shown in SPM3A have been removed from the updated figure.
3419	10	1	10	8	"Coastal erosion was used as the indicator for land degradation" (line 7). Coastal erosion, which is not representative enough as an indicator, has little to do with land degradation. So it is suggested to consider a change. [, China]	Noted. The summary bars shown in SPM3A have been removed from the updated figure.
27591	10	1	10	8	Figure SPM.3b, left plots: It should please be specified why and how the SSPs 1-3 can be directly equated to increasing levels of exposure and vulnerability (to what?). Please include some more detail to explain that choice (excluding other SSPs), and add clear line of sight to the underlying assessment in the report. Figure SPM3.b, right plot: We would caution to change the axis of the RFC figure as this figure is known to policy makers as an iconic figure since AR3. Changing its axis might rather confuse the high level message of the RFCs. [, Germany]	Noted. Further details on the SSPs, including levels of exposure and vulnerability, are provided in both the SPM text and in Figure 4. Line of sight to underlying assessment has been added in the technical caption.
24543	10	1	10	8	Is food insecurity the best term for this figure? [, Ireland]	Noted. However the term food insecurity has been retained for the revised version of this figure as the embers shows risk of food insecurity as a function of GMST increase for each of the shown SSP's (it would be counterintuitive to have a risk of food security)
30349	10	1	10	8	Figure SPM 3b, B) food insecurity as a function of share of land based mitigation for 2 degrees stabilization: it is not easy to understand what is expressed on the basis of the current text only. Is there such a clear positive connection between land use mitigation and food insecurity? There is also a positive connection between soils organic matter and food security, for instance. [, Netherlands]	Noted. The figure has been redrawn and the selection of burning embers has been revised. In the updated figure (now SPM2) the former SPM3B stand alone ember has been replaced with 'Mitigation through bioenergy deployment causes risks to food systems, terrestrial ecosystems and water scarcity'
3003	10	1	10	8	The use of burning embers for the purpose of this report can be misleading. Yes, additional risk can be detectable and attributable, but SMALL! [, Russian Federation]	Many thanks for the comment. The risks detailed in this report have complex methodologies, which are further described in Chapter 7. Burning embers nevertheless remain important because they can be used to highlight risks, not only from climate hazards but from our responses, including mitigation and adaptation.
17763	10	1	10	8	The figure SPM.3b uses land degradation and food security as examples. The caption informs that the former displays only coastal erosion, and the latter only food price - evidently sub-sampled from the data shown in figure SPM.3a. It would seem that it would be more proper to name the elements in the figure as "coastal erosion" and "food price" as they clearly do not correspond to land degradation as a whole, nor food security. [, Sweden]	Noted. The summary bars shown in SPM3A have been removed from the updated figure. For SPM3b now includes embers for land degradation, food insecurity and desertification.
20757	10	1	10	8	When representing the differed shared socio-economic pathways, it is unclear why SSPs 4 and 5 have not also been included, which should be shown to give a comprehensive picture. [, United Kingdom (of Great Britain and Northern Ireland)]	SSP 4 and 5 are further detailed in Figure 4 of the SPM. All SSPs are not included in this figure due to space limitations. SSP1 and SSP3 cover the best case and worst case scenarios, which should provide sufficient range for policy makers.
20759	10	1	10	8	Figure SPM3b is quite misleading, as using a single indicator to represent land degradation, or food insecurity does not give an overall picture. For example, coastal erosion is affected by many factors that do not correlate with land degradation, as is therefore no representative of land degradation overall. The tiles 'land degradation' and 'food insecurity' should be replaced with 'coastal erosion' and food price rise' respectively to avoid misleading the reader. [, United Kingdom (of Great Britain and Northern Ireland)]	Noted. SPM3B has been revised
6111	10	1	10	8	It would be better to put this figure SPM3b in landscape position for better visibility [Jacques-Andre Ndione, Senegal]	Noted. The redrawn figure has been specifically designed for a portrait orientation.

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31835	10	1	10	8	the figure could be improved by adding A) and B) to the figure itself, as well as A) to the caption at line 4. The caption already contains a B) and this would make it more consistent and intelligible [Samantha Grover, Australia]	Noted. The visual of the figure has been thoroughly revised with text captions now included on the figure for each section to guide the reader.
31837	10	2	10	2	SSP stands for Shared Socioeconomic Pathways and this figure caption is missing "Shared" [Samantha Grover, Australia]	Noted, the caption has been revised.
14559	10	2	10	3	The text indicates that risks of land degradation and food insecurity are shown 'as a function of global warming' under different Shared Socio Economic Pathways (SSPs). This language does not make clear whether or not there is a causal link between global warming and land degradation/food insecurity. For example you could chart global population 'as a function of global warming' under the different RCPs, even though there may be no causal link between these variables. Land degradation and food insecurity are influenced by a range of socio-economic drivers which vary through time in the SSPs. It is not clear from the figure and caption whether climate also influences these phenomena and if so how important it is compared to other factors. [, Canada]	Many thanks for the comment. Noted. The text in the SPM and also in the figure caption has been revised.
24413	10	2	10	7	Figure SPMB.3 is hard to understand. In addition, it seems inconsistent with SPM3.A The burning ember on food security related to mitigation is very interesting, we would like to ask for keeping it but with efforts to make it as clearly explained as possible. It should also be explained in the text. [, Belgium]	Noted. The figure has been redrawn and the selection of burning embers has been revised. In the updated figure (now SPM2) the former SPM3B is now - (i) Different socioeconomic pathways affect levels of climate related risks, and (ii) Mitigation through bioenergy deployment causes risks to food systems, terrestrial ecosystems and water scarcity
33091	10	2	10	7	Figure SPM.3 The level of warming indicated as "present day warming" is misleading. It is the warming for the decade 2006–2015, which is not "present day" at all in 2019. Present warming is estimated to about 1°C in SR15, and could be a little more in 2019. The indicated period could be labelled "recent past" or something like that, with the years explicitly indicated. It would be useful to also indicate 2017 or 2018. Isn't there any observed permafrost degradation in the past, or does it lack attribution? [Philippe Marbaix, Belgium]	Noted. Yes, the warming is for 2006-2015 and not present day. Text will be reworded. Also, the data has been updated to reflect the final outcome of the consensus discussions. Dummy variables were included in the figure sent for review. Permafrost degradation has been observed in the past.
24231	10	4	10	4	To which AR report the considered SSP for figure SPM 3b blong (AR 5 or AR 6)? [Kamal Djemouai, Algeria]	Noted. Diagrams indicate transitions between undetectable, moderate, high, and very high risks to humans and ecosystems. The method is based on a literature review of estimated impacts at different global mean surface temperature levels (O'Neill et al. 2017) including emerging literature on Shared Socio-economic 10 Pathways (SSPs) as well as literature from IPCC AR5 and SR1.5.
6855	10	4	10	4	The socio-economic pathways are not described in the SPM and their is no concrete reference to it. [Markus Giger, Switzerland]	Noted. SSPs are now explained in the SPM text: BOX A7: Shared Socioeconomic Pathways (SSPs).
26031	10	5	10	5	The A) mention and the letters in the figure seem to be missing. [, France]	Noted, the caption has been revised.
30057	10	5	10	5	In the caption to figure SPM3b, reference is made to "B)", but there is no mention of B in the figure itself. [, Netherlands]	Noted, the caption has been revised.
17567	10	5	10	5	Does the level of warming follow from SSP (or the accompanying RCP)? [, Sweden]	Noted. Further details on the relationship between SSP and RCPs and different levels of warming are now provided in a table in the report. According to Riahi et al. SSPs consist of a narrative outlining broad socio-economic characteristics in future but are not scenarios. The climate change scenarios include socioeconomics, emissions and climate response are determined by both the SSP and the anthropogenic forcing of the climate system.
7715	10	5	10	5	What is meant by 'B)'? [Hiroaki Kondo, Japan]	Noted, the caption has been revised.

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5313	10	5	10	5	Figure SPM 3b: "Food security" should be changed to "food insecurity". [Klaus Radunsky, Austria]	Noted. However the term food insecurity has been retained for the revised version of this figure as the embers shows risk of food insecurity as a function of GMST increase for each of the shown SSP's (it would be counterintuitive to have a risk of food security)
14497	10	5	10	5	B) is here. where is A) ? [Shuzo Nishioka, Japan]	Noted, the caption has been revised.
14499	10	5	10	5	"B) ,,,,sentence needs more explanation, as it is important to warn urgent needs of land based mitigation in comparison to increasing adaptation cost for food insecurity. [Shuzo Nishioka, Japan]	Noted, the caption has been revised.
33477	10	6	10	6	<p>What is a 2°C stabilisation in 2100? Why do you not reference a scenario (incl. the IPCC report)? This sound particularly questionable because there is no scenario that stabilises global warming relative to pre-industrial levels at 2°C. RCP2.6's best estimate is at 1.6°C by 2100 and RCP4.5's warming is more likely than not to exceed 2°C and "warming will continue beyond 2100 under all RCP scenarios except RCP2.6" (ICCP, 2013). Thus this qualification makes no sense.</p> <p>Cited References: ----- IPCC, 2013. Summary for policymakers. In: Stocker, T. F., Qin, D., Plattner, G.-K., Tignor, M., Allen, S. K., Boschung, J., Nauels, A., Xia, Y., Bex, V., & Midgley, P. M. (eds.). Climate change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC). Cambridge University Press: Cambridge, United Kingdom and New York, NY, USA. 3-29. (https://www.ipcc.ch/report/ar5/wg1/) Ip066 [Andreas Fischlin, Switzerland]</p>	Noted. There is no unique way to define temperature for a particular RCP level. The reviewer is correct that the transient temperature in 2100 in the RCP2.6 is less than 2C for most climate models. However, the RCP2.6 has a >66% of staying below 2C and has an equilibrium temperature of ~2C with a climate sensitivity of 3C. This gets more complicated for the RCP4.5, which has a 2100 temperature of ~2.6C, a CMIP model mean temperature in 2300 of ~3C, and a equilibrium temperature of ~3.5C with a climate sensitivity of 3C.
14561	10	7	10	7	Why is coastal erosion used as an indicator of land degradation? Land degradation is caused my many factors dicussed in this report, many of which would have no influence on coastal erosion. Moreover, future coastal erosion might be driven mainly by sea level rise, which is unconnected with land degradation away from the coast. [, Canada]	Noted. The summary bars shown in SPM3A have been removed from the updated figure.
17325	10	7	10	7	Maybe it would be relevant to state here why coastal erosion has been used as indicator for land degradation (i.e. it is the land degradation process the most directly impacted by climate change according to literature in chapter 4. [Maria Helena Cruz de Carvalho, France]	Noted. The summary bars shown in SPM3A have been removed from the updated figure.
33879	10	7	10	8	How reliable are the selected indicators such as coastal erosion for land degradation and price rise for food insecurity? Please consider to include a rationale for this choice or include additional indicators as appropriately. [, Norway]	Noted. The summary bars shown in SPM3A have been removed from the updated figure.
13431	10	7	10	8	Only coastal erosion was used as indicator for land degradation, so that when the other factors are considered, the risks should go higher. [Lourdes Tibig, Philippines]	Noted. The summary bars shown in SPM3A have been removed from the updated figure.
17327	10	7	10	8	I suggest adding to the "food price rise was used as an indicator for food security" the following: "based on the literature in chapter 5". [Maria Helena Cruz de Carvalho, France]	Noted. Details on specific indicators have been added to the technical caption.
31839	10	7	10	8	chose one of "the indicator" or "an indicator" and use this in both instances, rather than using both, because the meaning is not the same. I think here "the indicator" is correct. [Samantha Grover, Australia]	Noted, the caption has been revised.

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30827	10		10		I am confused / concerned about the statement that 'coastal erosion was used as the indicator for land degradation' - sure coastal erosion is such a specific form of change in land and a natural response to a changing environment that it is not a suitable generic indicator of degradation and shouldn't be presented as such. [Mike Morecroft, United Kingdom (of Great Britain and Northern Ireland)]	Noted. The summary bars shown in SPM3A have been removed from the updated figure.
30829	10		10		Fig. 3b. I do not understand why at the high SSP differs from low and medium SSPs at present day temperature rise – we are already at this point – it's a fact not a model projection (as the food insecurity figure seems to show) [Mike Morecroft, United Kingdom (of Great Britain and Northern Ireland)]	Noted. The figure has been redrawn with further explanation of SSP's provided in the SPM text (BOX A7).
17387	10		10		Analysis of the risk to the ecological system is missing [Taehyun Park, Republic of Korea]	Partially accepted. In the updated figure the top panel shows 'human and ecosystems health' as part of the systems at risk (previously SPM3A) and the bottom panel 'depicts risks to humans and ecosystems as a function of the land area employed for mitigation through bioenergy plantations'
25897	10	1			"We suggest to refer to food security whose definition is agreed by FAO and the Committee on Food Security. This would imply in the SPM figures to refer to "impacts on food security" instead of "risks of food insecurity". Please explain what is total mitigation. The difference between the 3 SSPs is the focal point of SPM-3b but there is no information neither in the Figure caption nor in the text of the SPM. Please introduce in the SPM text or in the caption a short description of the main characteristics between SSP1, SSP2 and SSP3 and how they relate to land. We suggest to better explain what "total mitigation" means. [., France]	Noted. Details of the SPPs have been added in the SPM text and also in another SPM Figure. The combined food insecurity ember has also been removed and risks to specific components to food systems highlighted instead.
2249	10	3			Currently it seems that the acronym for "socio-economic pathways" should be "SEP" not "SSP". Please insert "shared" before "socio-economic pathways". [Nina Hunter, South Africa]	Noted, the caption has been revised.
23301	10	4			The burning ember diagrams have always tried to reflect climate impacts (or risks). Exposure and vulnerability are simply inputs into impacts/risk assessment. So perhaps change the caption to 'SSP1 to 3 reflect increasing levels (from low to high) of climate change impacts or risks in human or natural systems. [Mark Howden, Australia]	Noted. Caption has been changed.
16435	10	5			what is "B"? [., Republic of Korea]	Noted, the caption has been revised.
4237	10	5			Figures show "Food insecurity". Text uses "risks to food security" that makes it harder to comprehend [Ralph Sims, New Zealand]	Noted, the caption has been revised.
6335	10				Figure SPM 3b provides a useful summary of how different socioeconomic choices (and associated land use patterns) affect risks of food insecurity and land degradation. However, as this summary is targeted at policymakers, recalling what SSPs are and what kind of world SSP1-3 describe would be very useful. [., Gambia]	Accepted. SSPs are now explained in the SPM text: BOX A7: Shared Socioeconomic Pathways (SSPs).
26237	10				Figure SPM3b: The level of concern for food insecurity at different percentages of land-based mitigation is very interesting, however it would be useful to have the same bar for different level of global warming (e.g. 1.5°C etc) [., Luxembourg]	Accepted.
29635	10				In SPM3b the column showing food insecurity risk for different levels of land-based mitigation is interesting and useful in principle, but as currently drawn it is difficult to understand the impact of the total amount of mitigation required. Different pathways for 1.5°C require different amounts of total mitigation, e.g. some 1.5°C pathways allow a later transition away from fossil fuels and therefore require a greater amount of CDR. How does this affect the figure? [., Saint Lucia]	Noted. This ember has been removed from the updated version of the figure. The new version shows risks 'related to food systems, terrestrial ecosystems and water scarcity, assessed here as a combined risk'. For both SSP1 and SSP3

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29637	10				The label "2 degree goal" is incorrect. The goal is well below 2, pursuing efforts for 1.5. It would be less policy prescriptive to refrain from using the word "goal" and to instead use the usual IPCC terminology for labelling emissions pathways. A focus on 1.5 would be most policy relevant here. [, Saint Lucia]	Noted, the caption has been revised.
5315	10				The caption should explain SSP1 (sustainability; higher income, higher yields, less meat intensive diets), SSP2 (middle of the road) and SSP3 (regional rivalry; scenario with high challenges to both, mitigation and adaptation) [Klaus Radunsky, Austria]	Accepted. The SSPs are now explained in the SPM text: BOX A7: Shared Socioeconomic Pathways (SSPs), and further detail is also provided in the figure annotation and caption.
41725	10				an even tougher figure: far reaching but thin on basis.. The bar with unique Y axis stand out and is hard to interpret. Why would coastal erosion (storm surges, SLR) be a measure of land degradation (over grazing?). Likewise calculating all of food security based on crop price without issues like GDP seems unjustified. [Michael Prather, United States of America]	Noted. The standalone ember on food security has been removed from the updated version of the figure,
27787	10				Authors are address risks on 3 aspect, desertificaion, land degradation and food insecurity, in Figure SPM 3a. However, I can found summar of risks under different SSP for only land degradation and food insecurity. Please add 'the risk of exposre and vulnerability on desertification' in Figure SPM 3b. [Raehyun Kim, Republic of Korea]	Accepted.
27789	10				What is the meaning of the picture on 'food insecurity' in Figure SPM 3b? [Raehyun Kim, Republic of Korea]	Noted. This ember has been removed from the updated version of the figure.
25899	11	1	11	1	A5 should include a summary of the findings on the CO2 fertilisation effects which are presented in Chapter 3 [, France]	Thank you, noted
41727	11	1	11	2	Is desertification exacerbated by CC or by the provision of services? Keep it simple: "Desertif affects the provision of ecosystem services.... Desertif is exacerb by CC." [Michael Prather, United States of America]	Noted the comment is taken into consideration in the final draf
6113	11	1	11	3	It would be better to write "Desertification is exacerbated by climate change affecting the provision of essential ecosystem goods and services including food, and increasing the risk of human migration and conflict (medium confidence) {3.3.2}." [Jacques-Andre Ndione, Senegal]	Accepted, The meaning of the sentence does not change
30367	11	1	11	4	A5 overlaps with A3.5 [, Netherlands]	Accepted, Text totally revised and restructured in the second draft
38287	11	1	11	4	There are a series of causal links described in the first sentence, the strengths of which range, and all of which are multifactorial. Suggest improving logical flow by ending the sentence with the word "food," and bringing the content of the remainder of the first sentence to follow the second sentence. [, United States of America]	noted
40351	11	1	11	4	On page 3-84 line 7 suggests there is a lack of conclusive evidence attributing desertification to climate change (the conclusion in section 3.9, so also check whether the chapter itself has some internal contradictions / need for smoothing the language). Therefore, consider rewording the sentence on page 11--the word exacerbate may not be the best choice because of the lack of conclusive evidence. Section 3.5.2 is about socio-economuc systems, so you could reword this sentence in the SPM to read "The interactions of desertification and cimata change affects the provision of essential ecosystem....". [Koko Warner, Germany]	Accepted. Text totally revised and restructured, considering this point and updated in the Second draft HS B5
13317	11	1	11	4	A5. Desertification is exacerbated by climate change affecting the provision of essential ecosystem services including food, and increasing the risk of human migration and conflict (medium confidence) {3.3.2}. Increasing population pressures, poverty, non governance combined with climate change are likely to push dryland populations beyond their resilience thresholds and the limits for their autonomous adaptation. {3.5.2} [Marina Rosales Benites de Franco, Peru]	Accepted, The meaning of the sentence does not chang

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28623	11	1	11	39	Again, the section does not clarify what is meant by conflict. It remains unclear whether violent conflicts or non-violent disputes are covered or both. This is important as general "conflicts of interest" can be seen as part of regular interactions in society, whether the use of violence is detrimental. Adding a section on conflict to the glossary and/or clarifying its use in this section is advisable for increasing clarity. [Nina von Uexkull, Sweden]	Noted addressed in the final draft
25143	11	1	11	44	Reduce length and detail of A5 to make it proportional to other subsections [Alexander Erlewein, Germany]	Thank you, noted
31549	11	1	11	44	What is the desertification definition here in this SPM? The human activities while changing the land use in limiting climate regions are one of the main driver for desertification process. This interaction with human activities as a driver for desertification is not even cited here. It would be acceptable only if this interaction is explicated on a definition of desertification or reinforced in a note. [, Brazil]	Accepted, the definition of desertification is that adopted by UNCCD. Text totally revised and restructured in the second draft
24545	11	1	11	48	The level of carbon loss to the atmosphere linked to desertification should be included here; UNCCD can provide figures [, Ireland]	Accepted, the comment is taken into consideration in the final draft
24547	11	1	11	48	Costs and benefits of reducing/eliminating carbon loss should be provided; also costs for soil restoration and carbon benefits [, Ireland]	Accepted, the comment is taken into consideration in the final draft
4875	11	3	11	3	Suggest correction of reference: 3.3.2 to 3.5.2 [, Japan]	Noted
3005	11	3	11	3	likely' : the IPCC calibrated uncertainty language should be employed. [, Russian Federation]	Noted
38289	11	3	11	3	Define "dryland." [, United States of America]	accepted
24235	11	3	11	3	"are likely to push" is a very weak language according to what's happening in the deserts, arid and semi-arid areas, where it's more correct to state "are pushing". [Kamal Djemouai, Algeria]	Accepted, it's corrected in the second draft
38291	11	3	11	4	"Increasing population pressures combined with climate change are likely to push dryland populations beyond their resilience thresholds and the limits for their autonomous adaptation." This is a sweeping, global statement that does not appear to reflect the paragraphs below. Refine to better reflect the analysis (e.g., populations in specific areas, time frames). [, United States of America]	accepted : this comment is supported in the second draft
32679	11	3	11	4	This statement must be qualified: is it true for ANY amount of climate change? This is too vague. [Jean-Pascal van Ypersele, Belgium]	accepted : this comment is supported in the second draft
22069	11	3	11	4	A5-Please check: 'Increasing population pressures.....autonomous adaptation'.....kindly provide confidence statement. [Suvadip Neogi, India]	Accepted, it's corrected in the second draft
15307	11	4	11	4	Suggest clarifying. What is meant by 'limits to their autonomous adaptation'? [, Australia]	accepted : this comment is supported in the second draft
8753	11	4	11	4	Include "autonomous adaptation" in the glossary or simplify the terminology for the SPM [Jean-Luc Chotte, France]	accepted : this comment is supported in the second draft
40277	11	4	11	4	delete THE before limits [Thelma Krug, Brazil]	accepted
20761	11	5	11	7	What is a larger role than previously estimated? What was the previous estimation? How big a role it may have played? [, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Text totally revised and restructured, considering this point and updated in the Second draft HS A
27595	11	5	11	8	Paragraph A5.1. would profit from more specificity please. [, Germany]	Noted
791	11	6	11	6	Action: replace "decrease in precipitation" by "changes in precipitation patterns", that in most cases, have more impact on desertification than the reduction of rains. [, Spain]	Rejected: Decreased precipitation has been demonstrated and has greater impact on desertification
31841	11	6	11	6	"decrease" should be "decreases" [Samantha Grover, Australia]	Accepted
26239	11	7	11	7	The word previously, does it refer to AR5? Please specify [, Luxembourg]	accepted : this comment is supported in the second draft

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4877	11	8	11	8	Suggest correction of reference: 3.3.2;3.3.1 to 3.3.2 [, Japan]	Noted, Editorial error corrected in the second draft
17569	11	9	11	9	Could delete "as measured by the aridity index", as too much detail for the SPM. The text becomes easier to read and to digest without it. [, Sweden]	Noted, corrected in the second draft
27599	11	9	11	12	Please provide the causes of this expansion. [, Germany]	Thank you for your comment. The revised text of the final draft has been substantially changed. The causes have been made more explicitly.
30073	11	9	11	12	This sentence is gramatically incorrect. We think the last part "as compared to the period of 1951–1980" should be removed. Also because there is no mention of the period 1951-1980 in section 3.3.1.2. [, Netherlands]	Accepted, addressed in the final draft
30075	11	9	11	12	In our view this claim cannot be made based on section 3.3.1.2. In section 3.3.1.2 nothing is said about the aridity index. In section 3.3.1.2.1 it is said that the Horn of Africa and parts of northern Africa experienced drying over the last three decades. This is not the same as eastern Africa mentioned in this statement. Except for the Mediterranean area and northern India it is not clear how expansion of drylands in the past three decades can be derived from section 3.3.1.2 for all the other regions mentioned. [, Netherlands]	Accepted. Text totally revised and restructured, considering this point and updated in the Second draft HS B5
41731	11	9	11	12	To read this long sentence, it would be best to combine the critical statement and not separate by 4 lines; "has already occurred over the last three decades in ..." Otherwise the already occurred could be across the holocene. [Michael Prather, United States of America]	Thank you for your comment which will be taken into consideration in the final
31843	11	9	11	12	have drylands not expanded in Australia? [Samantha Grover, Australia]	accepted : this comment is supported in the second draft
6841	11	9	11	13	No relevant text was found in section 3.3.1.2 of Chapter 3. This paragraph appears only in the Executive summary of Chapter 3. It is suggested that the authors check it and add text and references in the main report. [Changke Wang, China]	Accepted, this comment is supported in the second draft
6797	11	9	11	15	The statement in A5.2 lacks uncertain language. Please add uncertain language in the report. [Changke Wang, China]	accepted : this comment is supported in the second draft
29909	11	9	11	15	Add evidence/confidence/agreement levels. [, Estonia]	Noted, corrected in the second draft
13433	11	9	11	15	Are there no confidence levels in these two statements? [Lourdes Tibig, Philippines]	Noted
30369	11	9	11	26	A5.2 and A5.4 could be supported by figures showing the impact of already occurred climate changes [, Netherlands]	Noted
27791	11	11	11	11	In the first sentence of A5.2, only two countries (Zambia, Zimbabwe) were included with several regions as an example of the expansion of drylands. An example would be the unification of a country or region to help create a balanced report. [Raehyun Kim, Republic of Korea]	accepted : this comment is supported in the second draft
29911	11	12	11	15	Missing references to the main report. [, Estonia]	Noted thank you
25901	11	12	11	15	Would it not be possible to mention the impacts for a greater warming? [, France]	Thank you for your comment. The revised text of the final draft details impacts under higher levels of global warming.
30077	11	12	11	15	It is not clear where this statement comes from (also because a reference to a section is missing). We could not trace it back in the background report (one would expect it in chapter 3). [, Netherlands]	Thank you for your comment which will be taken into consideration in the final draft
20763	11	12	11	15	The phrase 'In the range of 1.5°C to 2°C global warming' does not make sense, and it is unclear if it is referring to the risks at 2°C relative to 1.5°C, or the risks at some undefined point between 1.5°C and 2°C relative to today's temperatures, or relative to preindustrial levels. [, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Text totally revised and restructured, considering this point and updated in the Second draft HS A6
22071	11	12	11	15	A5.2-Please check: 'In the range.....water availability'.....Kindly cite reference from where it has been adopted. [Suvadip Neogi, India]	Noted
22073	11	12	11	15	A5.2-Please check: 'In the range.....water availability'.....kindly provide confidence statement. [Suvadip Neogi, India]	Thank you for your comment which will be taken into consideration in the final draft

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15729	11	14	11	15	In this part some regions have been mentioned as vulnerable areas for water shortage in Mediterranean but the most vulnerable areas of Middle east is ignored though this area is more important from this viewpoint. [, Iran]	Accepted. Text totally revised and restructured, considering this point and updated in the final chapter 3
793	11	15	11	15	What is "Levant" referring to? If it is "levantino español" it should be specified (Spanish east coast). If not, it should be better defined, as it is not a term that is commonly used. [, Spain]	Thank you, noted
3007	11	16	11	18	desertification' is an outcome of climate change and other impacts, therefore drylands cannot be vulnerable to desertification, but some ecosystem services of drylands can be; editing is needed. [, Russian Federation]	Partially accepted: Drylands are vulnerable to desertification under the impact of drought and human activities, the degradation of ecosystem services is the consequence
25903	11	16	11	20	Would it not be possible to mention the impacts for a greater warming? [, France]	Noted, addressed in the final draft
17571	11	16	11	23	There is some duplication, which could be removed. In both A5.3 and A5.4, the combined effect of climate change and desertification is spoken of, and its impacts on human and natural systems. Distinction between bullets is not clear. [, Sweden]	Accepted. Text totally revised and restructured
4193	11	17	11	17	Again, "ecosystem service" is used instead of "ecosystem serviceS". [Eugenia Gayo, Chile]	Noted Thank you
3909	11	17	11	17	Write: "... to the increase of temperatures, the increasing number, frequency and intensity ...". [, Switzerland]	Noted
23011	11	19	11	20	This statement should be reformulated as follows: "At 1.5°C to a 2°C global warming, the ecosystem services and biodiversity in drylands will face an increased risk from desertification, compared to warming below 1.5°C". [Anastasios Kentarchos, Belgium]	Noted, Thank you
4879	11	19	11	20	This is evaluated not only "At 1.5°C to a 2°C global warming", but also at higher temperature levels. Please provide precise reference, and some more explanation about the reason of choosing the specific levels of global warming. Or the phrase "At 1.5°C to a 2°C global warming" could be replaced by "global warming" simply. [, Japan]	Accepted. Text totally revised and restructured, considering this point and updated in the Second draft HS A6
20765	11	19	11	20	The phrase 'At 1.5°C to a 2°C global warming' does not make sense, and it is unclear if it is referring to the risks at 2°C relative to 1.5°C, or the risks at some undefined point between 1.5°C and 2°C relative to today's temperatures or relative to preindustrial levels. Assuming the former, it should read something like 'Ecosystem services and biodiversity in drylands will face an increased risk from desertification at 2C relative to 1.5C'. [, United Kingdom (of Great Britain and Northern Ireland)]	Noted
20767	11	19	11	20	no 'the' needed before ecosystem services [, United Kingdom (of Great Britain and Northern Ireland)]	Noted, corrected in the second draft
21791	11	19	11	20	Is this compared to the current. Or to other levels of global warming? It could easily be read as the latter. [Graham von Maltitz, South Africa]	Higher levels of warming would impact biodiversity and ecosystems services
40279	11	20	11	20	... ARE PROJECTED to face instead of will face [Thelma Krug, Brazil]	Noted
6115	11	21	11	22	It would be better to write "The interaction of climate change and desertification reduces the provision of dryland ecosystem goods and services and degrades ecosystem structure and function, including loss of biodiversity, affecting food (and wood) security and human well-being (high confidence) {3.2.1, 3.3.2, 3.6.1, 3.6.2}." [Jacques-Andre Ndione, Senegal]	Accepted. Thank you; this will be corrected in the final draft
25905	11	21	11	23	"Food security" is a key word that should not be altered by adding "(and wood)". A better formula could be "food security, wood provision". [, France]	Noted," and wood" will be deleted
27601	11	21	11	26	Paragraph A5.4 mixes cause and effect (climate change and desertification) and also mixes two different issues (provision of ecosystem services etc. and CO2 exchange rate due to dryness. Please restructure. [, Germany]	Accepted. Text totally revised and restructured, considering this point and updated in the Second draft HS B5

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3009	11	23	11	23	wood security' ??? [, Russian Federation]	Noted," and wood" will be deleted
24415	11	23	11	24	What is the meaning of "The area where dryness is rate limiting " ? It needs to be clearer. If it means the exchanges, please write it so. [, Belgium]	Accepted. Text totally revised and restructured
26241	11	23	11	24	This sentence does not make sense. [, Luxembourg]	noted
41733	11	23	11	24	"Dryness limits CO2 exchange" is odd. What one needs to know is whether the soil C becomes more or less likely to decompose. It is the net exchange that provides the CO2 feedback. Can you say that dryness limits the uptake of CO2 by vegetation and soils? that would make the feedback clear. [Michael Prather, United States of America]	Accepted. Text totally revised and restructured, considering this point and updated in the Second draft HS A5
20769	11	23	11	26	The sentence 'Dryness limits CO2 exchange of vegetation and soils in desert areas' implies that this is always the case, whereas the next sentence implies that it is only sometimes the case. This would read better if phrased as 'Dryness can limit CO2 exchange of vegetation and soils. The area in which it does so has increase by 6%...' [, United Kingdom (of Great Britain and Northern Ireland)]	Noted; Thank you
22075	11	23	11	26	A5.4-Please check: 'Dryness limits.....in other areas'.....kindly provide confidence statement. [Suvadip Neogi, India]	Noted , corrected in the second draft
22077	11	23	11	26	A5.4-Please check: 'Dryness limits.....in other areas'.....Please specify the other areas (drylands with scattered vegetation or drylands in different regions of the world or other terrestrial ecosystems?) [Suvadip Neogi, India]	Noted , corrected in the second draft
27603	11	24	11	24	The sentence is unclear: "The area where dryness is rate limiting has increased..." To which rate is it referring? [, Germany]	Accepted. Text totally revised and restructured, considering this point and updated in the Second draft HS A4 and B5
21787	11	24	11	24	is "desert areas" correct, or should it be dryland areas? [Graham von Maltitz, South Africa]	Accepted , corrected in the second draft
8583	11	24	11	24	I don't understand "rate limiting". Clarify. [Marc Aubinet, Belgium]	Noted
23757	11	24	11	25	where dryness is area limiting. Statement not clear to readers. Limiting what rate ? [, India]	Accepted. Text totally revised and restructured, considering this point and updated in the Second draft HS A4 and B5
25145	11	24	11	26	something is wrong with this sentence [Alexander Erlewein, Germany]	Accepted. Text totally revised and restructured, considering this point and updated in the Second draft HS A4 and B5
29913	11	24	11	26	There is something missing in this sentence. Also add confidence etc levels. [, Estonia]	Accepted. Text totally revised and restructured, considering this point and updated in the Second draft HS A4 and B5
25907	11	24	11	26	Which rate is limiting ? This is not clear for policy makers. [, France]	Accepted. Text totally revised and restructured, considering this point and updated in the Second draft HS A4 and B5.3
38293	11	24	11	26	The statement "The area where dryness is rate limiting has increased by 6% since 1948 and is expected to increase by at least another 8% by 2050 with the result that net carbon uptake is about 27% lower than in other areas" is supported by a single study: Yi et al., 2014. Suggest broadening the statement such that it is supported by multiple studies and assigning an appropriate confidence level, or removing the statement. [, United States of America]	Accepted, thank you
13435	11	24	11	26	What is meant by "The area where dryness is rate limiting"? [Lourdes Tibig, Philippines]	Noted
7255	11	25	11	25	Is the projection based on current or different emission scenarios? [Debra Roberts, South Africa]	Noted, Text totally revised and restructured
7717	11	25	11	25	'by 6%': Until when is this value attained? [Hiroaki Kondo, Japan]	Noted, Text totally revised and restructured
3911	11	25	11	26	It is not clear which models are used for these predictions? [, Switzerland]	Noted, Text totally revised and restructured
17799	11	25	11	26	The projection of an 8% increase by 2050 in the area where dryness is rate limiting is based on what emissions scenario / level of warming? [Quentin Lejeune, Germany]	Accepted. Text totally revised and restructured, considering this point and updated in the Second draft HS A4 and B5.3
40281	11	25	11	26	suggest... resulting in a net carbon uptake about 27 per cent lower. [Thelma Krug, Brazil]	Noted

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21789	11	26	11	26	what is meant by "other" areas? [Graham von Maltitz, South Africa]	Other than drylands
29915	11	27	11	36	This is a very important paragraph, but it needs to be made clearer. It seems that sand/dust storms have both cooling and warming effects. Which one dominates? [, Estonia]	Noted, thank you. In this context, warming effects are dominant
27605	11	27	11	36	To better understand the risks of sand storms, we kindly ask the authors to quantify the impact of dust storms wherever possible. Also it would be interesting to know about changes between past and present sand storms. [, Germany]	Noted, thank you
7719	11	28	11	28	(high confidence) should be italic. [Hiroaki Kondo, Japan]	Noted, Editorial error corrected in the second draft
3011	11	28	11	30	The statement should be consulted with WG1: probably, 'heat' should be replaced with 'solar'. [, Russian Federation]	Noted, thank you
17573	11	30	11	30	The "depending on the types and amounts of aerosols present" is not clear. Assumedly, the idea is that the degree/nature of impact on clouds and precipitation varies with the aerosol types, which, however, does not add much to the point being made. The sentence could be shortened via omission of the mentioned part of the sentence. [, Sweden]	Noted, corrected in the second draft
40283	11	30	11	30	remove comma after present [Thelma Krug, Brazil]	Noted, Editorial error corrected in the second draft
7721	11	30	11	34	Font size is inconsistent. [Hiroaki Kondo, Japan]	Noted, thank you
4881	11	32	11	32	Suggest correction of reference: 3.5.2 to 3.5.2.8 [, Japan]	Noted, Editorial error corrected in the second draft
6799	11	32	11	34	The expression "Higher intensity of sand storms and sand dune movements under climate change also cause damage to transportation and solar energy generating infrastructures (high confidence) (3.5.22)" is incorrect. In Chapter 3, 3.5.2.9 is Dust. Storms and Impacts on Transport Infrastructure, 3.5.2.10 is Dust Storms and Impacts on Energy Infrastructure. Please correct. [Changke Wang, China]	Noted, Editorial error corrected in the second draft
15731	11	33	11	34	In this part the damage that deposition of dust causes to transportation and solar energy generating structure has been mentioned but one of the more important impact from this viewpoint on power transmission lines and oil and gas facilities have not been mentioned. [, Iran]	Noted
4883	11	34	11	34	Suggest correction of reference: 3.5.22 to 3.5.2.9, 3.5.2.10 [, Japan]	Noted, Editorial error corrected in the second draft
14563	11	34	11	35	It is not correct that deposition of dust on the oceans causes a cooling. According to the references cited in 3.4.1.1 (e.g. Doherty and Evan, 2014) dust in the atmosphere exerts a cooling influence via inducing changes in cloud properties while it is in the atmosphere, not when it is deposited onto the oceans. [, Canada]	Noted
17575	11	34	11	35	For clarity, it would be good to clarify whether the cooling effect is regional or widespread, continuous or episodic and whether it is a part of the natural climate system/variability, or results from changing (anthropogenic) activity/forcing. [, Sweden]	Noted, for clarity, it would be good to clarify whether the cooling effect is regional or widespread, continuous or episodic and whether it is a part of the natural climate system/variability, thank you
29247	11	34	11	36	The last sentence in this para does not fit in; should have stronger element of assessment [Jan Fuglestedt, Norway]	Noted
13437	11	34	11	36	Please find a better word than "contested". Or revise the statement to reflect the fact that there is no agreement in the findings. [Lourdes Tibig, Philippines]	Accepted. Text totally revised and restructured
20771	11	37	11	37	Could you clarify whether the combination of pressures are already contributing to migration etc or are projected to contribute to these impacts? Currently it's not very clear [, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Text totally revised and restructured, considering this point and updated in the Second draft HS A6

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
20773	11	37	11	39	Is a medium confidence statement is appropriate here? For example, section 3.5.2.2 does not discuss climate change in relation to poverty at all, only desertification, and merely states that there is limited evidence for the link between the two. Based on the assessment in the underlying chapter, other impacts such as conflict and human migration may be more deserving of the medium confidence language but it should be made clearer that climate change and desertification are enabling conditions for these, not direct causes - the current language is too strong on this. [United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Text totally revised and restructured, considering this point and updated in the Second draft HS A6
21975	11	37	11	43	I do not quite understand how adaptation measures and adaptation measures are related to migration on the same level, I would assume that adaptation would prevent migration, while there are of course other drivers for migration? [Petra Minnerop, United Kingdom (of Great Britain and Northern Ireland)]	Noted: Text totally revised and restructured, considering this point and updated in the Second draft HS B5
24237	11	38	11	38	For an SPM report, its important to be more clear n what are those other factors? [Kamal Djemouai, Algeria]	Noted, corrected in the second draft HS A6
29917	11	39	11	41	Add evidence/confidence/agreement levels. [Estonia]	Noted, thank you
4885	11	39	11	41	The current SPM explains that desertification causes conflicts using the Sahel as an example. Yet, it is noted in Chapter 3 (P3-41, Line 30) that "The droughts and desertification in the Sahel are likely to have played a relatively minor role in the conflicts". Suggest introducing the case in Syria, where desertification is discussed to have played a direct role, instead of the Sahel. [Japan]	Accepted, the Middle East countries have been taken into account in the FOD of chapter 3
7723	11	39	11	41	Font size is inconsistent. [Hiroaki Kondo, Japan]	Noted, thank you
32381	11	39	11	41	The statement about increased conflicts between pastoralists and crop producers requires the same nuance as the statement about climate change induced migration - the multiple drivers should be recognized, including the possible deliberate promotion of intensified food production systems by agricultural policies. [Simone Lovera-Bilderbeek, Paraguay]	Noted thank you
38295	11	41	11	41	It is not clear whether this sentence is expressing the complexity of climate change itself and desertification-induced migration, or the relationships between climate change and desertification and migration. The following sentence describes migration and environmental change as interrelated but separate processes. Moreover, the first sentence equates desertification-related migration with climate change-related migration, which oversimplifies both processes. Suggest rephrasing the sentence on line 41 to reflect this: "The relationships between climate change, desertification, and migration are complex." [United States of America]	Accepted. Text totally revised and restructured.
26081	11	41	11	41	Insert "The relationship between" before "climate change and desertification" [Reid Detchon, United States of America]	Noted, thank you
38297	11	41	11	43	The sentence beginning with, "Any attribution of..." is too vague for the non-expert, and could use one or two examples (perhaps in parentheses) at the end of the sentence to illustrate "other adaptation measures undertaken by populations exposed to environmental risk." [United States of America]	Accepted. Text totally revised and restructured, considering this point and updated in the Second draft HS B5
22079	11	41	11	43	A5.6-Please check: 'Any attribution....environmental risk'.....kindly demystify. [Suvadip Neogi, India]	Accepted. Text totally revised and restructured, considering this point and updated in the Second draft HS B5
6117	11	41	11	44	The sentence "Any attribution of migration to environmental change should account for multiple drivers of mobility as well as other adaptation measures undertaken by populations exposed to environmental risk (high confidence). {3.5.2.4}" should be highlighted in bold. [Jacques-Andre Ndione, Senegal]	Accepted

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
24417	11	42	11	42	We suggest to add/specify that "environmental change" is not a synonym of "CC", as the current formulation of the SPM gives that impression; [, Belgium]	Accepted. Text totally revised and restructured
4887	11	44	11	44	Suggest correction of reference: 3.5.2.4 to 3.5.2.6, 3.5.2.7 [, Japan]	Noted, thank you
24549	11	46	11	47	Why is the term food production not used? [, Ireland]	Thank you for your comment. Climate change impacts affect the entire food system chain, including food supply that goes beyond food production. Therefore, A6 details impacts in the food production (see A6.4 and A6.6) mention about crop yields and reduction of productivity.
30371	11	46	11	47	A6 Here it should be added that autonomous or wealth induced food consumption patterns (eg increased dairy or meat consumption) lead to increased GHG-emissions [, Netherlands]	Thank you for your comment. Rejected. The A6 deals with "Climate change is projected to create additional stresses on land systems exacerbating 36 existing risks related to desertification, land degradation and food security". Impacts of food systems on Climate Change are detailed in Section B.
30707	11	46	11	47	The Subtitle is not clear. What is meant by Food System and Climate Change Interaction?. We suggest to rename it to "Impacts of Climate change on Food system and security" [, United Republic of Tanzania]	Thank you for your comment. Suggestion accepted. The revised subtitle is "Climate change is projected to create additional stresses on land systems exacerbating 36 existing risks related to desertification, land degradation and food security"
27901	11	46	11	47	Insert food quality and quantity. It should read food insecurity through impacts on food availability, access, utilisation, stability, quality and quantity [Itchell Guiney, South Africa]	Thank you for your comment and suggest. Accept. The Quantative (decrease of crop yield) and Qualitative (changes in nutrient composition) has been mentioned in A.6.4.
20775	11	48	11	48	This could be made clearer. Suggested wording: 'For example, the significant warming experienced in north-eastern China is thought to have contributed to the expansion of rice cultivation areas since 1990.' [, United Kingdom (of Great Britain and Northern Ireland)]	Thank you for your comment. The final draft version has only included mentions to regional at a global level.
40393	11		11		Does likely (not in italics) refer to the outcome of a probabilistic assessment? [Valerie Masson-Delmotte, France]	Noted. The revised version has revised the use of uncertainty language in the sentence.
30231	11	1	12	24	Especially in the global regions SSA, Middle East-North Africa and South Asia a series of extreme states and changes in socioeconomic and land condition factors have been found over the period 2010-2050. This becomes more worrisome in case of high levels of poverty, inequality, religious and ethnic diversity, weak governments and institutions. See Chapter 5 in: Van der Esch et al 2017. Exploring future changes in land use and land condition and the impacts on food, water, climate change and biodiversity. Scenarios for the UNCCD Global Land Outlook. PBL-Netherlands Environmental Assessment Agency. [, Netherlands]	Thank you, noted
25147	11	30	12	23	Details on yield changes (such as provided in A2.3) would be expected in this section [Alexander Erlewein, Germany]	Noted
14565	11	37	12	41	The relationship/tension between climate change-driven impacts and competition for land is relevant in the Indigenous context and could be included as an example here. This type of information should be collected during the research process that informs the development of such reports. [, Canada]	Noted. Thank you

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
1581	11	46	12	23	Global governments could further alert businesses & human populations to the risks of disruptions arising from food system change. The general public arguably seem to need further education & knowledge on the impacts of increased food consumption (including meat, dairy & vegetable oil), on GHG emissions & unhealthy – personal, human – outcomes, shocks to food systems arising, competition for land (e.g. rice cultivation), and impacts on global food inequalities. This is because while odd features of them appear on BBC news & LinkedIn, their wider dissemination among the UK public arguably remains incomplete. Examples here include more malnourished people, smallholder farmers, women & the urban poor & ultimately risks of food shortages & declining food yields globally from higher levels of global warming. Here, as an ordinary UK citizen myself, it strikes me that not many work colleagues, family, friends or UK locals know much about such developments. More publicity about them seems needed, in the UK at least, and is something the UK government could take a lead on, if resources are available to do so. [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	Thank you for your comment. Partially accepted. Impacts of climate change on food systems have been included in A6.
27607	11	46	12	23	Relevant points are missing, such as functioning markets, market access, purchase power, minimum income, insurances, strategic food storage. Please revise. [, Germany]	Thank you for your comment. Noted and accepted. The A6 has been revised and include details about the negative impacts.
5317	11	46	12	23	Food system and climate change interactions: the key message that food system and climate change interactions lead to food insecurity is ok. However, the following 5 paragraphs lack important information that is hidden in figure SPM 3. It seems important to reflect on the message included in this figure also in text. The following wording is suggested: Not only climate change has considerable impact on the risks of food insecurity but even more the socio-economic pathways. Only the choice of SSP1, a pathway that comprises sustainable development, can avoid high risks for food insecurity as well as limiting the percentage of land-based mitigation in total mitigation to achieve the 2oC goal to less than 10%. [Klaus Radunsky, Austria]	Thank you for your comment.
23013	11	46	12	24	Section A6 needs to be less general. Each statement lists risks and drivers. It would be better if the section gave an indication of each driver's relative importance or how the risks and drivers interact. For example: - in A6.1 which of the disruptions listed are most frequent or most significant? - in A6.2, what is the relative importance of the different listed drivers of food system emissions: dietary change, transport etc. [Anastasios Kentarchos, Belgium]	Thank you for your comment. Noted and accepted. The A6 has been revised and include details about the negative impacts.
3421	11	48	12	2	The conclusion of this SPM section, which is inconsistent with Chapter 5 of the underlying report, is requested to be checked. "A6.1. Climate change affects food systems through the disruption of growth, storage, manufacture, transport, and retail {high confidence}." , while in the ES of Chapter 5, it is described that "Climate change will affect food systems through disruption of transport, manufacture, and retail, limiting food access (medium evidence, high agreement)." Two suggestions: 1) Delete "growth, storage" because no conclusions in Chapter 5; 2) Change "high confidence" to "medium evidence, high agreement" to be consistent with Chapter 5. [, China]	Thank you for your comment and suggestion. The revised final draft improve the inconsistency between the SPM and C5 ES. The sentence has been rephrased as following: "As global temperatures increase, the potential for adverse impacts on crop yield, food supply stability, vegetation loss, fire damage, permafrost and coastal degradation, soil erosion and water availability become more severe. (high confidence)."

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24551	11	48	12	2	Growth is a very unspecific term for food. Given the complexity of food production systems and their vulnerabilities, this issue should be clearer [, Ireland]	Thank you for your comment and suggestion. This ambiguity about "growth" has been removed. The final draft is the following: "As global temperatures increase, the potential for adverse impacts on crop yield, food supply 37stability, vegetation loss, fire damage, permafrost and coastal degradation, soil erosion and water 38availability become more severe. (high confidence)."
29753	11	48	12	2	Should include the word 'harvesting' to account for traditional food systems. [Tanya Smith, Canada]	Thank you for your comment. Partially accepted. The sentences has been rephrased and includes "adverse impacts on crop yields", which includes <u>harvesting</u> .
15883	11	2			ok! [Caroline Vincke, Belgium]	Noted. Thank you.
27593	11	4			Please avoid jargon: What does "autonomous adaptation" mean? This is an unusual expression in the IPCC-context. [, Germany]	Accepted. Text totally revised and restructured, considering this point and updated in the Second draft HS B5
23255	11	4			The end component of this statement (.. resilience thresholds and the limits for their autonomous adaptation.' is not consistent with the underlying text. Nor is it consistent with the literature. This needs to be fixed properly. [Mark Howden, Australia]	Accepted. Text totally revised and restructured, considering this point and updated in the Second draft HS B5
15885	11	5			This paragraph is not convincing. In drylands areas, in particular the sahelian belt, climate variability shaped the landscapes and vegetation ecosystems, as well as defined the land use and land management (cf 332 "specific regional context and P29 L29-I38 in chapter 3). . Indeed, the recent increase of T° is making the climate more constraining than before. As for evapotranspiration, it can only increase if there is water in the soils and a vegetation to use it so I would be more cautious here. [Caroline Vincke, Belgium]	Thank you for this comment ; considering this point and updated in the Second draft
18321	11	5			It would be more informative to have a confidence statement about the role of climate change specifically rather climate change + natural climate variability. Can we attribute already desertification trends to human-induced CC in some regions? [Edouard Davin, Switzerland]	Accepted:Desertification induced by human activities is exarbatated by climate change in drylands areas
41729	11	5			This claim is difficult to justify: CC driven changes in precip to date are not very robust, changes in heavy vs light are robust. Yes, climate variability has always in the past (before humans) driven desertification thoruh decrease in precip - So are you blaming and formally attributing current desertific regions to cliamte change? need ot back that up. [Michael Prather, United States of America]	accepted : this comment is supported in the second draft
27597	11	9			Either properly introduce the "aridity index" or do not use it in the SPM. [, Germany]	Accepted. Text totally revised and restructured, considering this point and updated in the Second draft HS B5
2251	11	9			As an SPM reader I would find it helpful to have the following inserted at the start of section A5.2.: "Drylands are areas susceptible to desertification, and the" [Nina Hunter, South Africa]	Accepted. Text totally revised and restructured, considering this point and updated in the Second draft HS B5
16437	11	11			please add "Mongolia, south-east Asia" [, Republic of Korea]	Thank you for your comment which will be taken into consideration in the final draft
15887	11	20			with positive feedbacks on global warming. [Caroline Vincke, Belgium]	Noted. Thank you.
15889	11	22			ok! [Caroline Vincke, Belgium]	Noted. Thank you.
2253	11	24			As and SPM reader I would find it helpful to have the words "in this way" inserted after "rate limiting" [Nina Hunter, South Africa]	Noted
16439	11	34			Please add "In addition, sand and dust storms move across countires and continents and influence many aspects of human life and natural phenomenon". [, Republic of Korea]	Noted,please add "in addition, sand and dust storms move across countires and continents and influence many hank you
23257	11	34			Perhaps use: 'Deposition of dust on the oceans by storms' [Mark Howden, Australia]	Noted

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41735	11	34			"Dust storms over the ocean and deposition of dust on the ocean surface reflect more sunlight and hence cool. Dust deposition provides a source of nutrients for the upper ocean, but the climate impact is contested." this is easier to read and more precise. [Michael Prather, United States of America]	Noted, thank you
41737	11	41			try: "Migration can be induced by CC and desertif, but the attribution is complex." [Michael Prather, United States of America]	Noted, thank you
41739	11	46			Cannot untangle this one. ? "Food systems are affected by CC and variability [natural variability is important historically], leading to food insecc..." [Michael Prather, United States of America]	Thank you for your comment. A6 has been revised and this sentence has been updated.
3013	12	1	12	1	likely' : the IPCC calibrated uncertainty language should be employed. [, Russian Federation]	Thank you for your comment. Calibrated language has been added.
25909	12	1	12	2	We suggest to add at the end of the sentence " ... and on the level of global warming." [, France]	Thank you for your comment. The sentences has been revised in the final draft version.
3913	12	1	12	2	As the impact of climate change may depend on the region, and that some regions may increase their food production while others will decrease it, it would b better to write: "The scale and direction of climate change impact ...". [, Switzerland]	Thank you for your comment and suggestion. The updated A6.6 details the regional and context specific magnitute of impacts, as following: "Impacts of projected future changes are location-specific with significant regional 27heterogeneity (high confidence). Crop yields and suitability are projected to decline as temperatures 28increase, especially in tropical and semi-tropical regions. There is also high confidence that aridity 29will increase in some locations with around half of the vulnerable population in South Asia, followed 30by Central Asia, West Africa and East Asia. Projections, however, provide no evidence for an 31increasing global trend in dryland aridity (medium confidence)."
22081	12	1	12	2	A6.1-Please check: 'Such disruptions.....on the region'.....kindly provide confidence statement. [Suvadip Neogi, India]	Thank you for your comment and suggestion. Comment accepted. The revised A.6.1 includes confidence language.
21979	12	1	12	11	The lower range of the temperature goal of the Paris Agreement should be mentioned in this context, if that is possible? I would assume that the figure opf a third of the mitigation potention (line 8 and 9) would be different, depending on a 1.5 or 2 Degree Scenario, or one that is in between? [Petra Minnerop, United Kingdom (of Great Britain and Northern Ireland)]	Thank you for your comment and suggestion. The revised A6.2 includes temperature ranges between 1.5C and 2C.
7257	12	3	12	3	Consider quantifying this growth. [Debra Roberts, South Africa]	Thank you for your comment. The sentences has been revised in the final draft version.
31551	12	3	12	3	There is a need of a better balance in the paragraph. While the higher consumption of processed food might have driven "excess intake and unhealthy outcomes", and the challenges to overcome hunger and promote adequate nutrition are still urgent and central, the growth of food production has had an important impact on the improvement of health, life expectancy, child survival, among other positive impacts, that include the economic development. A balanced approach allows for an accurate identification of the problem, hence a better development of effective solutions, otherwise impossible. [, Brazil]	Thank you for your comment. Accepted. The needs for overcome hunger and provide health nutrition is described in Section B of the SPM final draft.
3015	12	3	12	3	Insert 'GHG' before 'emissions' [, Russian Federation]	Thank you for your comment. The sentences has been revised in the final draft version.
38299	12	3	12	3	Should this read Food system greenhouse gas emissions? [, United States of America]	Thank you for your comment. Sentence revised in the SPM final draft.
22083	12	3	12	3	A6.2-Please check: 'Food system emissions.....demand for food'.....Please specify production/consumption side or both. [Suvadip Neogi, India]	Thank you for your comment. Partially accepted. The quantitative statements concerning GHG emissions of food systems are detailed in Section B of the SPM final draft.

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15297	12	3	12	4	Food system emissions are growing globally (robust evidence, high agreement). Suggest it would be helpful to provide quantitative estimates here. To begin to understand the tradeoffs required, policy makers will need to be able to understand the quantitative dimensions to this issue. [, Australia]	Thank you for your comment. Partially accepted. The quantitative statements concerning GHG emissions of food systems are detailed in Section B of the SPM final draft.
25911	12	3	12	4	We suggest to specify that it is the demand for food "per capita" in order to make a clear distinction with the impacts of increasing population. [, France]	Thank you for your comment. Partially accepted. The quantitative statements concerning GHG emissions of food systems are detailed in Section B of the SPM final draft.
23319	12	3	12	4	It would be helpful to quantify food system emissions around here to provide policy-makers with a perspective on the substantial proportion of global GHG emissions that they constitute. [Mark Howden, Australia]	Thank you for your comment. Partially accepted. The quantitative statements concerning GHG emissions of food systems are detailed in Section B of the SPM final draft.
24419	12	3	12	6	The increased consumption of imported food, is also a major cause of GHG emission through its transport and conservation. [, Belgium]	Thank you for your comment. Partially accepted. The details impacts of food systems on climate change are detailed in Section B.
24553	12	3	12	6	Can the increase in emissions be quantified? Numbers and details, including impacts on radiative forcing over time, relative to other sectors and linked to population growth, would be useful here in place of generic statements [, Ireland]	Thank you for your comment. Partially accepted. The quantitative statements concerning GHG emissions of food systems are detailed in Section B of the SPM final draft.
38301	12	3	12	6	Section A6.2 describes the growth in global food system emissions due to increasing population and food demand, along with a discussion of the impact of diet shifts. It would be useful to also describe how the trend of increasing yields helps to mitigate the need for increased cropland area to meet the growing demand for food (1.2.2.3), but climate impacts that affect yields will exacerbate these effects. [, United States of America]	Thank you for your comment. Impacts of climate change on crop yields are described.
33017	12	3	12	6	To "A6.2." - ADD: these changes in diet and population effects are distributed variably (impact of diet change by developed countries is more significant). Not adding such comment could lead voices in powerful countries to focus on change in developing countries (whose people have less agency over choice of diet). [Rianne ten Veen, Netherlands]	Thank you for your comment. The entire A6 has been revised. Differences between developed and developing countries have been detailed.
29811	12	3	12	6	Increasing population and demand for food has also centralized food production systems. The move away from locally-specific diets in this process has had a significant impact on Indigenous peoples. [Tanya Smith, Canada]	Thank you for your comment. Partially accepted. The quantitative statements concerning GHG emissions of food systems are detailed in Section B of the SPM final draft.
15299	12	4	12	6	The growing emissions from food systems are attributed entirely to 'diet shifts occurring across the world have increased consumption (including meat,dairy and vegetable oil)'. Suggest there should also be a discussion here about supply side factors affecting the composition of food system outcomes, including the effects of government policies. [, Australia]	Thank you for your comment. Your suggestion has been addressed in the revised Section B of the final draft SPM.
24421	12	4	12	6	Diet shifts do not necessarily result in increased consumption, do you mean that there is an increase in consumption of certain products? The sentence should be phrased in a clearer way. [, Belgium]	Thank you for your comment. Your suggestion has been addressed in the revised Section B of the final draft SPM.
29919	12	4	12	6	How much of the increase in the carbon footprint is attributable to food consumption and increases in it? Please add numbers/estimates. [, Estonia]	Thank you for your comment. Your suggestion has been addressed as following: "Since the early 1960s, the supply of global per capita food calories increased by about one third, with the per capita consumption of vegetable oils and meat more than doubling"
27609	12	4	12	6	It would be interesting to know, whether the per capita consumption of food also increased. From this statement it is not clear whether only the absolute consumption increased due to increasing population. Please clarify. [, Germany]	Thank you for your comment. Your suggestion has been addressed, as following "Since the early 1960s, the supply of global per capita food calories increased by about one third, with the per capita consumption of vegetable oils and meat more than doubling"

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33881	12	4	12	6	The reference to "excess intake" and "unhealthy outcomes" feels a bit "outside the mandate " in this context. Consider rewriting to put in context with co-benefits or not include in this paragraph. [, Norway]	Thank you for your comment. Your suggestion about including c-benefits of healthy diets has been addressed in section B of the SPM final draft.
38303	12	4	12	6	"In the past decades, diet shifts occurring across the world have increased consumption (including of meat, dairy and vegetable oil) resulting in a larger GHG emissions footprint, excess intake and unhealthy outcomes." The "unhealthy outcomes" phrasing seems extremely broad when discussing global dietary shifts. Is this perhaps too oversimplified even for the SPM? Is this really an adequate summary of Section 5.2? It seems like mentioning that some of the shifts in diet are beneficial, but then specifying in which way they are also unhealthy in aggregate would prevent people from being overly skeptical of this claim. The difference between industrialized nations increasing meat consumption from already moderate/high levels versus increased access to meat in developing nations (and dietary shifts from grain to meat) seems too important to fully gloss over. [, United States of America]	Thank you for your comment. Details about co-benefits and trade-offs of dietary changes are included in Section B of the final draft SPM.
8585	12	4	12	6	The increased consumption of imported food, is also a major cause of GHG emission through its transport and conservation. [Marc Aubinet, Belgium]	Thank you for your comment. Partially accepted. The details impacts of food systems on climate change are detailed in Section B.
22085	12	4	12	6	A6.2-Please check: 'In the past decades.....unhealthy outcomes'.....kindly provide confidence statement. [Suvadip Neogi, India]	Thank you for your comment. Sentence revised in the SPM final draft.
2139	12	5	12	5	It also results in additional climate changes through non-GHG pathways. [David Kaimowitz, Nicaragua]	Thank you for your comment. Partially accepted. The revised A6 includes additional challenges of non-GHG emissions.
30445	12	5	12	6	Meat and dairy consumption have increased in some parts of the world (Asia and Africa) and decreased in others (Europe and stabilized in North America). It is important to make this very clearly as there are different drivers behind: population growth, rising incomes, cost, health or animal welfare concerns... [Anne Mottet, Italy]	Thank you for your comment. Your suggestion has been addressed in Section B of the SPM final draft.
24555	12	5	12	6	Can adverse impacts on human health be quantified? If so, please include data [, Ireland]	Thank you for your comment. Your suggestion has been addressed in Section B of the SPM final draft.
8217	12	5	12	6	The reference to 5.2 should be changed to 5.4. Further it might be considered to add «increased land use change and deforestation.» after « GHG emissions footprint». The same applies to chapter 5 Ex Summary p 5 line 22-25 [Harold Leffertstra, Norway]	Thank you for your comment. Citations and numbering have been revised.
30079	12	6	12	6	What is meant by 'unhealthy outcomes'? Please rephrase more clearly. [, Netherlands]	Thank you for your comment. Your suggestion about defining "healthy diets" has been addressed in Section B of the SPM final draft.
3915	12	6	12	6	Why does the IPCC in this report mention "unhealthy"? Is the IPCC the body that can assess health impact of food regimes? If it is not the case, delete this reference to healthy food regimes. [, Switzerland]	Thank you for your comment. Your suggestion about defining "healthy diets" has been addressed in Section B of the SPM final draft.
15249	12	6	12	6	the traceability of this bullet is wrong, it should be 5.4. Please double check. [Zhai Panmao, China]	Thank you for your comment. Citations and numbering have been revised.
25913	12	7	12	7	This should be consistent with A.5.3 and either use « climate events », or « climatic events », unless there is a difference and then it should be specified. [, France]	Thank you for your comment. Your suggest has been accepted and implemented. The final draft SPM revised the definition and terminologies used to improve consistency across the entire SPM.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
29741	12	7	12	9	(Paragraph 6.3). Here on line 7, for clarity, I would suggest that you insert 'as well as slow onset climate change impacts, including...' and on the next lines, 8-9, you could add that the yield losses may be caused directly by weather-related damage such as extreme heat or extraordinarily heavy rainfall, or could be caused indirectly by crop/livestock pests, fungal diseases etc which thrive better in the new climatic conditions. Slow onset impacts of climate change on food production also include sea level rise and storm surges and associated salinization of soils eg Bangladesh delta. I would consider these impacts to be significant enough to merit including in the SPM. [Mairi Dupar, United Kingdom (of Great Britain and Northern Ireland)]	Thank you for your comment. Partially accepted. Detailed impacts of climate change on food systems is included in chapter 5. The SPM summarised impacts and details potential policies to reduce these adverse effects.
24557	12	7	12	11	This bullet is unclear and may be out of place [, Ireland]	Thank you for your comment. Bullet revised in the final draft SPM.
4889	12	7	12	11	The statement "...together with changes in temperature, water availability and CO2 concentrations are already causing shocks..." may be inaccurate as the change in CO2 concentrations itself is in principle a cause of other global changes, and increase in CO2 concentration per se would generally cause a positive effect (not a shock), so reconsideration in language is suggested. Because variation in "CO2 concentrations" is not considered as an extreme event, deleting "CO2 concentrations" from the sentence might be a possible solution. [, Japan]	Thank you for your comment. Sentenced revised.
17389	12	7	12	11	The climate events impacting ecosystems including biological diversity and their link to the socio-economic changes is completely omitted here. Considering the suggested co-benefits of mitigation and adaptation options suggested in Chapter 1 for example in 1.2.2.1 [Taehyun Park, Republic of Korea]	Thank you for your comment. Your suggestion has been addressed in Section C and D of the SPM final draft.
3017	12	8	12	8	As it is clear from the last phrase of A6.3, 'some' should be inserted before 'food systems'. [, Russian Federation]	Thank you for your comment. Suggestion accepted in the revised draft.
25255	12	8	12	8	In general, CO2 concentrations (increasing) will benefit the crops...then why this is mentioned as one of the negative factors...instead the sentence can be changed to..... despite beneficial effects of CO2 [Naresh Kumar Soora, India]	Thank you for your comment. Your suggestion has been addressed as following: "Food quality will also be affected by higher CO2 concentrations through changes to metabolic processes that lead to changes in nutrient composition, for example the amount of protein, or zinc, with impacts on nutritional security "
3423	12	8	12	9	"and CO2 concentrations are already causing shocks to food systems, leading to yield losses, market failures, transport, trade and retail disruptions, with ensuing detrimental effects on food security". This conclusion, which is inconsistent with the underlying report, is suggested to be checked. [, China]	Thank you for your comment. Sentences revised to be consistent with Ch5 conclusions.
7437	12	8	12	9	Use the term "yield reduction" instead of "yield loss" [tarig Ibrahim, Sudan]	Thank you for your comment. Suggestion partially accepted. The final draft of the SPM includes " potential for adverse impacts on crop yield".
31553	12	10	12	10	We suggest a new phrase: the specific impact depends on the agroecosystem characteristics and of the nature and intensity of the climate events [, Brazil]	Thank you for your comment. Sentenced revised in the final draft of the SPM.

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30081	12	10	12	10	The sentence: 'The specific impact depends on the agroecosystem characteristics.' is rather meaningless (since it is always true). We would suggest to leave it out or be more specific on what it means, based on key messages from section 5.2.2. For example: 1) warming may pose a growing threat to agricultural yields and food security in regions at low and mid latitudes, (2) evidence for observed climate change impacts on agriculture remains not as robust as for other systems or sectors because agriculture is a managed system, (3) A recent analysis related to global aridity change has found that a drying tendency since 1951–2011 has been dominating the 'global grain production area,' which may be affecting yields of the four major crops (maize, rice, wheat, and soybean). [., Netherlands]	Thank you for your comment. Sentenced revised in the final draft of the SPM.
17829	12	10	12	11	Impacts also depend on management practices, and the nature of the food supply chain. These should be added after "agroecosystem characteristics". [Quentin Lejeune, Germany]	Thank you for your comment. Sentenced revised in the final draft of the SPM.
14501	12	10	12	11	The specific impact depends on the local agroecosystem characteristics. [Shuzo Nishioka, Japan]	Thank you for your comment. The context specificity of impact magnitude has been included in the SPM final draft: "There are increasingly negative effects on GDP from impacts on land-based values and ecosystem service as temperature increases, although the impact varies across regions."
29921	12	12	12	12	What are the climate change driven changes behind it? Please add. [., Estonia]	Thank you for your comment. Details of climate change drivers have been included.
27903	12	12	12	14	The example is too specific. Perhaps include more general examples, which are representative of the global trends. [Itchell Guiney, South Africa]	Thank you for your comment. This bullet has been revised in the SPM final draft and removed reference to specific countries. More generic conclusions have been stated.
41741	12	12	12	16	The attribution and causality here are confusing, try: "CC impacts on food systems and human security* are complex. For example, rice-cultiv.... in the region. Yet, this beneficial increase in rice production comes with reduced biodiversity, expanded deforestation, destruction of natural wetlands, and exacerbated competition for land and water resources." *I presume competition for land invokes human security? [Michael Prather, United States of America]	Thank you for your comment. This bullet has been revised in the SPM final draft and removed reference to specific countries.
7259	12	12	12	17	An assessment of this bullet point is required. [Debra Roberts, South Africa]	Thank you for your comment. This bullet has been revised in the SPM final draft and removed reference to specific countries.
15301	12	12	12	17	Suggest removing the speculative assertions made in this section. For example, if rice cropping has expanded, the section should be definitive about what has been displaced, rather than speculate on what could have happened. [., Australia]	Thank you for your comment. This bullet has been revised in the SPM final draft and removed reference to specific countries.
3425	12	12	12	17	The conclusion of this section lacks the support of the underlying report, with Box 5.1 containing no more than 'Expansion of rice cultivation in Northeast China provides an example of observed agricultural adaptation to climate warming.', there being no mention of 'Climate change-driven impacts on food systems also exacerbates competition for water resources, including from aquifers.'. Section 5.2.3.4 does not deal with the negative effects of the expansion of rice cultivation either. The expansion of rice cultivation in Northeast China originates from the adaptation measures in response to the objectively factual regional warming under global climate change. At present, there is no clear evidence to prove that this behavior has reached the potential critical point of permanently changing land cover and ecosystem functionality. So it is suggested to delete "However, expansion of rice-cropping land area in response to warming could reduce biodiversity, expand deforestation, and encourage reclamation of wetlands. Climate change-driven impacts on food systems also exacerbate competition for water resources, including from aquifers". [., China]	Thank you for your comment. This bullet has been revised in the SPM final draft and removed reference to specific countries.

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4891	12	12	12	17	"Expansion of rice-cropping land area in response to warming" seems to be a beneficial example. We would suggest explaining how those beneficial aspects are also considered for this climate change - land competition assessment. [, Japan]	Thank you for your comment. This bullet has been revised in the SPM final draft and removed reference to specific countries.
16441	12	12	12	17	This paragraph imply one of type of adaptation against global warming. When temperature is increasing, rice paddy filed is increasing to adapt. There are much of ecosystem services in rice paddy fields proved by research on Korean-Japan Cooperation studies. So it is hard for rice cultivation countries to agree with 'reduce biodiversity, expand deforestation, and encourage reclamation of wetlands'. [, Republic of Korea]	Thank you for your comment. This bullet has been revised in the SPM final draft and removed reference to specific countries.
3019	12	12	12	17	An uncertainty qualifier would be appropriate for the whole statement. [, Russian Federation]	Thank you for your comment. Confidence language has been revised in the entire SPM.
22087	12	12	12	17	A6.4-Please check: kindly provide confidence statement. [Suvadip Neogi, India]	Thank you for your comment. Confidence language has been revised in the entire SPM.
38305	12	12	12	24	A6.4 and A6.5 lack confidence statements. [, United States of America]	Thank you for your comment. Confidence language has been revised in the entire SPM.
23777	12	13	12	15	Sentences look contradictory..consider revision [, India]	Thank you for your comment. This bullet has been revised in the SPM final draft and removed reference to specific countries.
25257	12	13	12	15	Sentences look contradictory..consider revision [Naresh Kumar Soora, India]	Thank you for your comment. This bullet has been revised in the SPM final draft and removed reference to specific countries.
3917	12	14	12	14	Delete "However". Rationale: the sentence uses the verb "could" which makes the sentence a conditional statement that is independent from what preceeds. [, Switzerland]	Thank you for your comment. Sentence revised in the SPM final draft.
23015	12	14	12	15	"However, expansion of rice-cropping land area in response to warming could reduce biodiversity, expand deforestation, and encourage reclamation of wetlands." How can increased rice cropping lead to wetland reclamation? - Understanding that wetland as a (semi)-natural periodically or episodically flooded land while rice is considered a crop and would consequently be labelled cropland? [Anastasios Kentarchos, Belgium]	Thank you for your comment. This bullet has been revised in the SPM final draft and removed reference to specific countries.
16443	12	18	12	18	The sentence 'Climate change is exacerbating global food inequality' is some weird. It will be better to change other sentence. [, Republic of Korea]	Thank you for your comment. Sentence revised in the SPM final draft.
38309	12	18	12	18	What is "food inequality," unequal access to food? The first sentence of the paragraph is in the present tense, while the remainder of the paragraph describes future projections. Is the first sentence based upon projections, or observations? If the latter, suggest that core writing team include such observations in this paragraph. [, United States of America]	Thank you for your comment. Sentence revised in the SPM final draft.
38311	12	18	12	18	"Climate change is exacerbating global food inequality." The rest of the paragraph identifies impacts likely to be experienced at 2°C or more warming. Either be more specific on impacts currently felt, or revise first sentence. [, United States of America]	Thank you for your comment. Sentence revised in the SPM final draft. Specific impacts of Climate Change on food systems have been included.
27615	12	18	12	19	"Malnourished people, smallholder farmers, women, and the urban poor are especially vulnerable". Please revise the list of vulnerable groups: - We cannot believe that women are generally more vulnerable than men, at least not more vulnerable than children? We suggest replacing "women" by "amongst them women and children". Please see our Entire Report comment on generalizations regarding women in this report. - Does this suggest that vulnerability depends on the scale of the farm? [, Germany]	Thank you for your comment. Partially accepted. The revised SPM details that impacts of climate change on food systems are context dependent, but does not detail specific vulnerable groups.
38313	12	18	12	19	What is the basis for these statements? They are not well supported in the referenced sections of the underlying text. [, United States of America]	Thank you for your comment. Sentence revised in the SPM final draft.

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4241	12	18	12	20	Give examples of the co-benefits and side-effects. Again there is an expectancy the reader will be knowledgeable. For policy makers, this is probably not the case for many. In fact the whole SPM text needs to be reviewed and rewritten with the target audience in mind. Most will not be scientists or experts. [Ralph Sims, New Zealand]	Thank you for your comment. Co-benefits and adverse effects have been detailed in sections B/C/D.
24559	12	18	12	23	Shorter statement and confidence levels should be provided [, Ireland]	Thank you for your comment. Sentence revised in the SPM final draft.
32681	12	18	12	23	Climate change is only one of the factors affecting food inequality. To put the role of CC in perspective, the other main factors should be listed (and discussed in the report as well). Reference should be made to Chapter 5, and for example Box 5.3 on Sustainable solutions for food systems and climate change in Africa. [Jean-Pascal van Ypersele, Belgium]	Thank you for your comment. The A6 bullet points have been revised in accordance to this Special Report scope and IPCC mandate. Context of Climate Change impacts has been included in the SPM final draft.
31555	12	19	12	20	unclear sentence, in the context of the paragraph. Smallholders who produce non-food cash-crops, that will be affected by climate impacts will have income reductions that will impact their ability to purchase food. The sentence has a logic, however, smallholders that produce non-food cash-crop are not at the core of public policy discussions on food inequality. The higher vulnerability, mentioned at the beginning of the paragraph, is related to their ability to produce, either for market (and income) or for subsistence. The sentence, as it is, generates an imbalance in the flow of thought, and only focuses in one very specific aspect of a more broader issue that involves a much broader reality and social groups... as was mentioned in the beginning of the paragraph. [, Brazil]	Thank you for your comment. Sentence revised in the SPM final draft.
29923	12	19	12	20	This sentence does not make much sense. Please revise and add examples, facts. [, Estonia]	Thank you for your comment. Sentence revised in the SPM final draft.
20777	12	20	12	20	Is this something that "will" happen or is happening right now? If the latter then the word "will" should be removed. [, United Kingdom (of Great Britain and Northern Ireland)]	Thank you for your comment. Sentence revised in the SPM final draft.
38315	12	20	12	22	The claim that "the Sahel, the Mediterranean, central Europe, the Amazon, western and southern Africa are at risk of food shortage at 2°C warming" is questionable. It is adapted from Section 3.5.2.3 of the IPCC 1.5°C Special Report, which states "Cross-Chapter Box 6 in this chapter highlights that, at 2°C of warming, new literature shows that risks of food shortage are projected to emerge in the African Sahel, the Mediterranean, central Europe, the Amazon, and western and southern Africa, and that these are much larger than the corresponding risks at 1.5°C." However, a careful review of Cross-Chapter Box 6 in IPCC 1.5°C Special Report does not find support for this statement. Rather it provides the following statement: "Generally, vulnerability to decreases in water and food availability is projected to be reduced at 1.5°C versus 2°C (Cheung et al., 2016a; Betts et al., 2018), especially in regions such as the African Sahel, the Mediterranean, central Europe, the Amazon, and western and southern Africa (medium confidence) (Sultan and Gaetani, 2016; Lehner et al., 2017; Betts et al., 2018; Byers et al., 2018; Rosenzweig et al., 2018)." The claim that there would be a "food shortage" does not acknowledge the roles of financial resources and global trade in the supply of food to a particular region. [, United States of America]	Thank you for your comment. Partially accepted. The revised SPM details that impacts of climate change on food systems are context dependent, but does not detail specific country/regional impacts.
13439	12	20	12	23	is the projected food shortage at 2 °C limited to only these countries? Or there other regions which could also be at risk, but are not included because there are no studies made/presented in these regions? If so, please indicate. [Lourdes Tibig, Philippines]	Thank you for your comment. Sentence revised in the SPM final draft.

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14567	12	21	12	21	Should 'food shortage' be replaced by 'declining yields'? The following sentence refers to 'declining yields' at higher levels of warming. Developed regions such as central Europe might be subject to declining yields without this leading to food shortages. [, Canada]	Thank you for your comment. Sentence revised in the SPM final draft.
21977	12	21	12	21	Why is here the 2 Deggree Celsius target mentioned, but not the 1.5 point of the range? [Petra Minnerop, United Kingdom (of Great Britain and Northern Ireland)]	Thank you for your comment. Accepted. Temperature ranges between 1.5C and 2C have been included in the revised SPM final draft.
15733	12	21	12	22	Multiple regions have been mentioned as the regions at risk of food shortage but here Middle east is ignored once again. [, Iran]	Thank you for your comment. Partially accepted. The revised SPM details that impacts of climate change on food systems are context dependent, but does not detail specific country/regional imapcts.
2085	12	4			Robust Evidence/high agreement [Tomas Molina, Spain]	Thank you for your comment. Confidence language has been revised in the entire SPM.
27611	12	6			"unhealthy outcomes" - rather unprecise term, better: "detrimental effects on human health such as obesity". What does "excess intake" mean? [, Germany]	Thank you for your comment. Your suggestion about defining "healthy diets" has been addressed in Section B of the SPM final draft.
4239	12	8			Not clear why CO2 concentrations are "causing shocks to food systems" when there is some evidence of increased plant biomass growth at higher CO2 levels (the reason why CO2 is injected into greenhouses to increase crop productivity) [Ralph Sims, New Zealand]	Thank you for your comment. Sentence revised in the SPM final draft.
27613	12	10			Please avoid jargon: What does "agroecosystem characteristics" mean? [, Germany]	Thank you for your comment. Suggestion accepted. Sentenced revised in the final draft of the SPM and removed jargons.
2087	12	10			Robust Evidence/high agreement [Tomas Molina, Spain]	Thank you for your comment. Confidence language has been revised in the entire SPM.
23017	12	15			"encourage reclamation of wetlands" is unclear in this context. [Anastasios Kentarchos, Belgium]	Thank you for your comment. This bullet has been revised in the SPM final draft and removed reference to specific countries.
38307	12	16			Change "exacerbates" to "exacerbate". [, United States of America]	Thank you for your comment. Sentence revised in the SPM final draft.
41743	12	18			to get the right meaning how about" "food inequality globally" - think this is what you meant, otherwise global modifies food rather than inequality. [Michael Prather, United States of America]	Thank you for your comment. Sentence revised in the SPM final draft.
27617	12	19			Please avoid jargon: What does "non-food cash-crop production" mean? [, Germany]	Thank you for your comment. Sentence revised in the SPM final draft and jargons removed.
41745	12	22			? "across the globe", otheriwese regions may refer to just those listed above. [Michael Prather, United States of America]	Thank you for your comment. Partially accepted. The revised SPM details that impacts of climate change on food systems are context dependent, but does not detail specific country/regional imapcts.
16445	12	23			please add "Water should be dealt in depth with food and energy together because water, food, and energy are closely linked and effective adaptation to climate change should be based on the nexus of those components". [, Republic of Korea]	Thank you for your comment. Sentence revised in the SPM final draft.
33999	13	23	3	27	it might be unclear that in this land report, here "all sectors" refers to energy and industry, therefore make explicit. [Elke Stehfest, Netherlands]	This sentence has been revised and the wording clarified
25915	13	1	13	1	There is very few information related to adaptation in §B . It reflects the fact that adaptation needs and options for land and forests have not been enough considered in the SOD of the report itself. Literature exists on these aspects which must be assessed in order to respect the scope of the SRCCL outlines. [, France]	Adaptation is mentioned in the revised draft in all sections from B1 to B7 as well as in Fig. SPM3 and several statements in corresponding subsections deal with adaptation.
26033	13	1	13	1	We appreciate the focus given in many messages of the SPM on the constraints related to mitigation policies in terms of area and types of land. [, France]	This focus is well reflected in the revised draft

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30233	13	1	13	1	The policy relevance of the B section would increase with an estimate of the technical potential contribution of land-based solutions to the climate budgets of 150 Gt C and 320 Gt C relating to the 1.5 and 2 degree C targets. This could be done in terms of technical potential C storage through restoration of SOC levels and vegetation from past land degradation and through prevention of the expected C emissions from future natural land conversion, peat land loss, SOC loss in current croplands from unsustainable land management practices and vegetation loss. A first estimate has been made in: Van der Esch et al 2017. Exploring future changes in land use and land condition and the impacts on food, water, climate change and biodiversity. Scenarios for the UNCCD Global Land Outlook. PBL-Netherlands Environmental Assessment Agency (Chapter 4). The analyses is spatial explicit, based on the SSP2 scenario for 2050, also including continuing land degradation trends per pixel as observed since 1982. It has been concluded that the combination of full restoration and prevention of C loss in soil and vegetation up to 2050 is potentially large in comparison with the current climate C budgets (> 160 Gt C storage excluding biomass and peat land restoration). Possibly, technical potentials for reducing emissions from N2O and CH4 can be added as well. Apart from the contribution to climate change mitigation these land based measures have clear co-benefits to water availability, food production, fiber, bio-energy and biodiversity. [, Netherlands]	The revised Figure SPM.4 provides an assessment of illustrative pathways linking policy, land use and climate change. For contrasted SSPs, estimated changes in land use, in carbon and food prices and in AFOLU net emissions (including land-based carbon sinks) are shown with their corresponding uncertainties. This Figure is placed in section C of the SPM since illustrative pathways refer both to biophysical and to socio-economic dimensions, including policies that may enable response options. The Global Land Outlook report of the UNCCD is cited in Footnote 2, page 2 of the revised draft.
3921	13	1	13	1	the title of this section should clear: "Land-related adaptation and mitigation response options". [, Switzerland]	Since this report deals only with land, reiterating 'Land-related' in the section title is not indispensable. A shorter title: 'Adaptation and mitigation response options' is used.
4243	13	1	13	2	Put BECCS in full or add as a footnote to figure. Add "Food" to both "supply management" and demand management" boxes. [Ralph Sims, New Zealand]	The BECCS abbreviation is defined before (in section B7). The wording has been revised for supply-side and demand-side options
20781	13	1	13	8	It is unclear what point the phrase 'Options under the three categories have significant potential to contribute to adaptation and mitigation...' is trying to get across, especially given we have already called them as adaptation and mitigation response options. Is the point that they contribute to both, not just one or the other? Is it that land-related adaptation/mitigation contributed to climate-related mitigation/adaptation? This sentence should be clarified to address this [, United Kingdom (of Great Britain and Northern Ireland)]	This sentence has been revised and the wording clarified
7653	13	1	13	27	It is surprising that this section does not address changing risk over time and the impact of that on adaptation options. Risk will be defined by how options perform under different plausible scenarios. There seems to be an implicit assumption in the way the text is written that we can "manage" our way out of the impacts. This is not a good message to be sending to those on the land or to governments which have regulatory mandates to address the impacts of climate change. Accordingly, the text could be added to with something like the following " The effectiveness of response options to address the impacts of climate change on land and its biodiversity will be substantially affected by the degree to which coping and adaptation thresholds are likely to be reached. This has significant governance implications for those managing the land and for governments with mandates to avoid and reduce risks from climate change impacts." References that could used to support this statement include the Special report on 1.5 degrees and accompanying literature. [Judy Lawrence, New Zealand]	The scope of section B1 is to introduce land-based adaptation and mitigation options. Changing risks over time and implications for policies and responses are dealt with in following SPM sections. The consequences of delaying mitigation and adaptation responses are addressed in section D3. In section B7 and Figure SPM4 contrasted scenarios are assessed.

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23019	13	1	13	28	<p>Section B1 & B2: general comments</p> <p>* Previous reports (and their SPMs) have established the need to enhance synergies and manage trade-offs in relation to mitigation, adaptation and land. Statements in this section should go one step further, with examples of how this can be done.</p> <p>* There appears to be high overlap between the messages of sections B1.1, B1.3 and B2. Please reduce duplication and use the space saved to provide more detail. The solutions may be largely location-specific, but merely saying this is of little help to national policymakers reading a global report. Can the SPM give examples of the kinds of (location specific) interventions that are most effective, and their spatial scale?</p> <p>* B1.2 needs to give some examples of interventions leading to adaptation and mitigation outcomes. At the moment, the statements lists outcomes (i.e. success is assumed ex ante). It is more useful to discuss potential measures.</p> <p>* B1.4 This statement needs to separate mitigation and adaptation goals in order to be meaningful. Stating that improved land management is not sufficient for mitigation is a truism (the sentence only makes sense for adaptation). The second sentence should be replaced by separate statements. While it is true that improved land management is a necessary (but not sufficient) contributor to both, its role and contribution towards mitigation and adaptation goals is of very different character.</p> <p>* Figures SPM4 & Table 1 are very useful. More reference to them should be made in the text in order to make the (rather generic) messages more tangible. Highlight elements from the figures that are most important: e.g. because they have the greatest mitigation / adaptation potential, greatest potential synergies or trade-offs, or strongest scientific underpinnings. [Anastasios Kentarchos, Belgium]</p>	<p>Sections B1 and B2 have been restructured in order to avoid overlap across subsections and provide a clearer understanding of the main findings of the assessment. While, multiple location-specific examples of response options can be found in the chapters, they are usually not placed in the SPM in order to focus on the generic findings. However, when responses are context specific this is reflected in the revised SPM (as in B.1). B1.2 section specifies the context specificity (e.g. biophysical context) of response options that target adaptation and mitigation. B1.4 section has been revised and is now centered on the time needed for responses to deliver impact.</p>
24669	13	1	13	28	<p>Synergies should be clearer; quantify outcomes as far as possible. Section B1.2 can be a lot clearer on these points [, Ireland]</p>	<p>Revised section B1.3 deals with synergies generated by response options across challenges with reference to Chapter 6 which provides several examples of such synergies.</p>
23585	13	1	13	28	<p>The translation of the words Adaptation and mitigation into Chinese is the meaning of adaptation and mitigation. Adaptation measures can be understood to reduce, prevent, and reduce the hazard. At any time during the climate change, it can be adapted, but the relief means only the climate. Changes can occur to alleviate, is a treatment and response to the current results, so it is recommended to explain again. [Huai Jianjun, China]</p>	<p>Translation to Chinese and to other UN languages of the SPM will take place in order to avoid possible misunderstandings for some of the non native English speakers.</p>
15315	13	3	13	4	<p>Suggest reviewing the categorisations 'land management', 'value-chain management' and 'risk management'. These headings are not especially useful and all mitigation and adaptation response options involve an element of risk management. 'Supply' and 'demand' may be appropriate alternatives for this purpose. [, Australia]</p>	<p>These categories of response options are presented with further details in Chapter 6 of the report and reference to the corresponding chapter sections is made when introducing these categories in section B.1 Supply-side and demand-side options are covered under the value chain management options in revised SPM Fig 3</p>
25917	13	3	13	4	<p>As these 3 categories are not explained under the subparagraphs of B1 section, this sentence should be better explained. [, France]</p>	<p>These categories of response options are presented with further details in Chapter 6 of the report and reference to the corresponding chapter sections is made when introducing these categories in section B.1</p>
33883	13	3	13	4	<p>The expression "value-chain management" is the only one of the three used here that are not present in the glossary. Please consider to include it in the glossary. [, Norway]</p>	<p>The glossary has been revised</p>

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40353	13	3	13	4	Risk is especially dealt with in Chapter 7, but of all the many cross references chapter 7 is not included. For instance, all the cross references have nothing from chapter 7 which really is the place where risk is explicitly addressed. [Koko Warner, Germany]	Policies and governance is part of section C of the SPM, including those managing risks
40355	13	3	13	4	Where do the three categories of response options come from? Is it true that land management, value chain management and risk management are THE three categories (or is it a matter of wording? does "land mgt" refer to ch2-4, and supply chain mgt Ch5, and risk mgt Chs 6-7? I'm just guessing, so it should be made explicit in Ch1 as well as the SPM)? There is not enough evidence to conclude that land-related adaptation and mitigation response fall into these categories. It looks like Ch1 and Ch6 have coordinated and created the figure 1.4, but there are TWO underlying references which seems thin (the ones in Ch1 on page 1-32 lines 32-33). The reader is left to merely accept the claim that there are three categories of addressing adaptation and mitigation, as the justification based on literature is not evident. The problem with this statement is that the audience (decision makers) may then be channeled too narrowly in their search for solutions (?), overlook important areas for action (a lot of these may be contained in Chapter 7 which is dedicated to risk mgt, governance, policy options), other chapters...from a wording point of view its easy to clear up this sentence but there is a deeper and significant cross chapter coordination issue that this sentence reveals and the results in the SOD are not sufficient to guide policy makers (the audience). [Koko Warner, Germany]	These categories of response options are presented with further details in Chapter 6 of the report and reference to the corresponding chapter sections is made when introducing these categories in section B.1. Policies and governance is part of section C of the SPM
20785	13	3	13	6	"Land-related...mitigation response options...may contribute to increasing food security..." appears to contradict page 21 rows 1-4, which says "deployment of land-intensive CDR options...that conflict with...food security.." Careful definitions added to the glossary may resolve this - see our comments on the entire report. [United Kingdom (of Great Britain and Northern Ireland)]	It has been clarified in section B5 that some land-based mitigation response options targeting the removal of CO2 from the atmosphere would have adverse effects on food security in case they would be deployed at scale to remove several Gt CO2.
13113	13	3	13	8	Message B1 should also refer, in line 6, to reducing biodiversity loss [David Cooper, Canada]	Ecosystem services are cited in sections B2 and B3 and are also addressed in Chapter 6. Reference to this chapter is made in B1
24423	13	3	13	8	This paragraphs appears related to figure SPM.4. We suggest adding a reference to it. In addition, the reference to SPM.1 should not be in the brackets (that refer to chapters) and is possibly a mistake (should it be table SPM.1?) [Belgium]	Wording has been checked and revised and sections have been reordered
24563	13	3	13	8	Not clear why such a limited set of headings has been used. A more constructive approach, based on the statement of the mitigation and adaptation challenges, and options to address these, including specific issues such as synergies and trade-offs, would be useful [Ireland]	The aim of sections B1 and B2 is to provide an overview of response options to interlinked challenges. Reference is made to Chapter 6, where further specifications concerning each response option are provided together with detailed assessments of potential positive or negative impacts.
30377	13	3	13	8	B1 next to land management, land governance should be mentioned since it is a prerequisite for sustainable land use systems. [Netherlands]	Section C deals with policy issues and land governance systems
33885	13	3	13	8	This text describes the land related options. We suggest to also highlight the substantial result described in B1.4 (line 23-26) which is very relevant and should be included in a concentrated form as a bold statement. [Norway]	Section B1.4 has been revised. In B1.1 the role of the land sector for nationally determined contributions to the Paris agreement is mentioned.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
13319	13	3	13	8	B1. Land-related adaptation and mitigation response options fall into three broad categories: land management, value-chain management, and risk management into healthy land ecosystems. Options under the three categories have significant potential to contribute to adaptation and mitigation and may also contribute to increasing food security, reduce poverty, and avoiding, reducing, and reversing land degradation and desertification. Trade-offs between multiple objectives can be reduced, but cannot be avoided altogether. [1.3.2, 1.4, 8 2.3, 2.7, 3.5.2, 3.7.1, 4.10, 6.3, 6.4 6.5, Figure SPM 1] [Marina Rosales Benites de Franco, Peru]	The wording of B1. has been revised to encompass these points
17801	13	3	13	8	In order to set the full context of the role land can play for climate mitigation and adaptation, it would be very useful to repeat here something along the lines of B1.4, which is very useful for policymakers. It should be clear to the latter that the trade-offs mentioned in this head statement can be reduced if rapid reductions in GHG emissions across sectors are achieved. [Quentin Lejeune, Germany]	The broader context of the role of the land sector in mitigation is introduced in section A and is further discussed in section C of the SPM. In B1.1 the role of the land sector for nationally determined contributions to the Paris agreement is mentioned.
22089	13	3	13	8	B1-Please check: kindly provide confidence statement. [Suvadip Neogi, India]	Wording and corresponding confidence statement were revised
22091	13	3	13	8	B1-Please check: 'Trade-offs between multiple objectives....'.....What are those objectives? Please specify. The synergies and trade-offs of land-based mitigation and adaptation strategies revealed increasingly importance on reducing adverse climate effects. Can we think of co-benefits also? [Suvadip Neogi, India]	Wording was revised here to clarify this statement
20783	13	3	13	21	Much of B1 and B2 could be removed, and the remainder combined with B3. The key messages to get across should be 1) that land based response options are vital to reaching the Paris Agreement's temperature goal, which could be relayed using the text 'Response options on land could provide around a third of near-term 2030 to 2050 mitigation potential required to reach Paris Agreement targets' (taken from chapter 2, p2-6 lines 29-30, or from B4.1), caveating this with text from the current B1.4 that measures across other sectors are also necessary; 2) That many of these options are interlinked and help both adaptation and mitigation (a combination of current B1.2 and B2.1); and 3) This will have significant effects on the land system (current B3.1 and B3.2). B3.3 can be moved into B4, where it relates better to the subject of CDR. The message that there are benefits and competing tradeoffs associated with these could be included here, or emphasised in section C. Other information, such as the different categories of response options (B1), the location-specificity (B1.1) and others (B2.2, B2.3) are quite detailed and technical are are not required in a summary for policy makers). [United Kingdom (of Great Britain and Northern Ireland)]	The broader context of the role of the land sector in mitigation is introduced in section A and is further discussed in section C of the SPM. In B1.1 the role of the land sector for nationally determined contributions to the Paris agreement is mentioned.
23021	13	3	13	27	The scope presented in B1 does not seem to include bioenergy. It is mentioned in Fig 4, but not supported by the text (why it would be there as a land measure, when it increases pressure on land, as recognised in B4). It should be better contextualised. [Anastasios Kentarchos, Belgium]	The role of bioenergy is part of the scope of responses assessed in B1 and further sections such as B5.
3427	13	3	13	27	This section points out that "Land-related adaptation and mitigation response options fall into three broad categories: land management, value-chain management, and risk management". But the report does not define land management, value-chain management or risk management. Moreover, 'value-chain management' is not addressed in Chapters 3, 4 or 5 of the report. So it is suggested to clarify the definitions of land management, value-chain management and risk management while supplementing words on value-chain management. [China]	These categories of response options are presented with further details in Chapter 6 of the report and reference to the corresponding chapter sections is made when introducing these categories in section B.1

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15251	13	3	13	27	contents related to the three categories of adaption and mitigation options should be more clearly seperated. And there are limited raceable contents for value-chain management in the main report. [Zhai Panmao, China]	These categories of response options are presented with further details in Chapter 6 of the report and reference to the corresponding chapter sections is made when introducing these categories in section B.1
24561	13	3	13	28	This section needs to be strengthened. There is little added value in providing high-level generic statements - specific issues should be addressed [, Ireland]	The aim of sections B1 and B2 is to provide an overview of response options to interlinked challenges. Reference is made to Chapter 6, where further specifications concerning each response option are provided together with detailed assessments of potential positive or negative impacts.
3021	13	4	13	4	Here and throughout the text a reader needs an access to definitions of specific terms, such as 'value-chain management'. Therefore, a Glossary is needed. [, Russian Federation]	Readers will have access to a comprehensive Glossary
38319	13	4	13	4	Since this is the opening portion of a Summary for Policymakers, recommend that the term 'value-chain' or 'value-chain management' be defined early on, since policymakers who do not typically deal with economics may not know its meaning. [, United States of America]	These categories of response options, including value chain, are presented with further details in Chapter 6 of the report and reference to the corresponding chapter sections is made when introducing these categories in section B.1.
33019	13	4	13	4	Re: "land management" - ADD: and wider policy decisions w impacts on land management (not all land management impacts stem from land management decisions, but e.g. happen as a consequence [intended or not] of e.g. economic development making land exploitation more/ less economically viable); adverse side effects of other policies on land management [Rianne ten Veen, Netherlands]	Economic dimensions are addressed with policy and governance in section C
25919	13	4	13	6	This sentence should highlight synergies situations provided by agroecology,agroforestry on agricultural lands, nature-based solutions (or natural climate solutions), in order also to be more consistent with SR15. [, France]	The aim of this sentence is to introduce the overview of response options to interlinked challenges. Reference is made to Chapter 6, where further specifications concerning each response option are provided together with detailed assessments of potential positive or negative impacts including impacts on ecosystem services. Section C mentions agroecological practices, see revised section C4.4
8847	13	5	13	5	delete 'have significant potential to contribute to adaptation and mitigation' for clarity of sentence [Jean-Luc Chotte, France]	This sentence has been revised and the wording clarified
14569	13	7	13	8	In standard usage, a 'trade off' is a balance between two desirable but incompatible objectives. The situation described here is simply one where some policy options will have negative effects on the areas listed. I suggest replacing with 'Some options with potential to contribute to adaptation and mitigation may have negative impacts on food security, desertification or land degradation, which can be reduced but not avoided altogether.' [, Canada]	This sentence has been revised and the wording clarified
23023	13	8	13	8	Instead of reference to SPM 1, shouldn't it be SPM 4? There is no reference to SPM 4 within the text. [Anastasios Kentarchos, Belgium]	This sentence has been revised and the wording clarified
4893	13	8	13	8	Suggest replacing "Figure SPM1" to "Figure SPM4". [, Japan]	This sentence has been revised and the wording clarified
30375	13	9	13	10	B1.1. 'deforestation and ecosystem loss and degradation" should be added [, Netherlands]	This sentence has been revised and the wording clarified
24565	13	9	13	13	This is not useful. Perhaps a focus on similarities rather than a statement of differences - recognise and quantify emissions, identify mitigation options such as good land management etc etc [, Ireland]	The aim of this sentence is to introduce the overview of response options to interlinked challenges. Reference is made to Chapter 6, where further specifications concerning each response option are provided together with detailed assessments of potential positive or negative impacts.
8849	13	10	13	10	delete 'for example' [Jean-Luc Chotte, France]	This sentence has been revised and the wording clarified
3923	13	12	13	13	Write: "... can draw on recognized good practices, new scientific and management innovations and traditional, ...". [, Switzerland]	This sentence has been revised and the wording clarified
7725	13	12	13	13	Too many 'and' [Hiroaki Kondo, Japan]	This sentence has been revised and the wording clarified

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13441	13	12	13	13	Can gender and equality be highlighted here ? [Lourdes Tibig, Philippines]	Section C deals with policy issues and land governance systems
22093	13	12	13	13	B1.1-Please check: 'Site-specific....local knowledge'.....kindly provide confidence statement. [Suvadip Neogi, India]	This sentence has been revised and the wording clarified
29755	13	12	13	13	It is positive to see acknowledgement of traditional, indigenous and local knowledge here. [Tanya Smith, Canada]	In section C this is emphasized, eg. In section C4.4
31557	13	14	13	14	In this paragraph the idea been discussed is not on how many different types of interactions that lead to positive adaptation and mitigation may exist. The sentence should be rephrased from "Many interactions lead to both..." to "Interactions may lead to both...." [, Brazil]	This sentence has been revised and the wording clarified
8587	13	14	13	14	It is not proven that all interventions lead to both adaptation and mitigation outcomes. I would rather write : "Interventions leading to both adaptation and mitigation outcomes should be prioritized" [Marc Aubinet, Belgium]	This sentence has been revised and the wording clarified
13115	13	14	13	17	include ecosystem restoration among interventions that lead to both A and M [David Cooper, Canada]	This sentence has been revised and the wording clarified
32907	13	14	13	17	include in the list restoring forests and ecosystems. [Doreen Stabinsky, United States of America]	Ecosystem adaptation is part of the responses addressed in Fig. SPM3
24425	13	14	13	17	Shouldn't it rather be "Interventions leading to both adaptation and mitigation outcomes should prioritized" ? Adaptation and mitigation can indeed have synergies, but may also involve trade-offs. [, Belgium]	This sentence has been revised and the wording clarified
25921	13	14	13	17	This should be more focused on the impacts of the different types of agriculture on biodiversity. It should be noted that agroecology practices leads to a sustainable use of biodiversity. Sources : « Agroecological practices help increase the profusion of pollinators by maintaining or creating greater diversity of pollinator habitats and flowering plants in agricultural and urban landscapes, as well as supporting the local adaptive management of habitat patchiness at different scales. Moreover, by removing the need to use pesticides and relying instead on natural pest-control practices based on the functional diversification of farms (genetic, species and ecosystem diversity), agroecology helps conserve pollinator species that are vital for the sustainable production of food-crop species and their long-term resilience to shocks and stresses » (IPBES 2016) and Pimbert, M., and S. Lemke, 2018: Using agroecology to enhance dietary diversity. UNSCN News, 43, 9 33–42 (already source in chap 5) [, France]	The social dimensions of agroecological practices are mentioned in C4.4
24567	13	14	13	17	Would prefer less jargon and more specific examples [, Ireland]	Concrete, location specific examples, are not presented in these SPM sections but reference is made to Chapters sections where concrete response options are detailed.
33887	13	14	13	17	Consider also specifying the type of interventions that lead to both adaptation and mitigation outcomes. [, Norway]	Examples are provided and further details can be found in Fig. SPM3
6119	13	14	13	17	It would be good if we can be more explicit about the agro-météorological disasters; we can cite them in brackets. [Jacques-Andre Ndione, Senegal]	This sentence has been revised and the wording clarified
17393	13	14	13	17	This list should include measures to decrease use of forest risk commodities and those with a large ecological and land footprint. [Taehyun Park, Republic of Korea]	This type of option is part of the sustainable sourcing response option mentioned in the value chain management category in Table SMP3
25923	13	15	13	15	Please define in the glossary what "agro-climatic" resource means. [, France]	Glossary has been revised
25925	13	15	13	15	"Damage" and "loss" have a specific meaning in the UNFCCC world. May want to check whether there is no possible misinterpretation here. [, France]	This wording has been revised
26243	13	15	13	15	Please reword to "damages and associated losses". [, Luxembourg]	This wording has been revised
30381	13	15	13	15	B1.2 please add ', forest,'after 'agro-climatic'. [, Netherlands]	This wording has been revised
29817	13	15	13	15	Perhaps define agro-meteorological in the glossary [Ley Debora, Guatemala]	This wording has been revised
30433	13	15	13	16	Please explain 'agro-climatic' and 'agro-meteorological' [, Netherlands]	This wording has been revised

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26083	13	15	13	16	Insert "flood and drought and other" before "agro-meteorological disasters" [Reid Detchon, United States of America]	This wording has been revised
31559	13	16	13	16	We suggest to add news terms to this sentence: "...disasters, adopting conservationist agriculture and adequate innovation technologies, increasing...." [, Brazil]	This wording has been revised
30383	13	16	13	16	B1.2 please add ' forest and other ecosystems,' after 'agricultural'. [, Netherlands]	This wording has been revised
25927	13	18	13	22	The word "synergies" should be used, as it is in SR15. [, France]	This sentence has been revised and the wording clarified
6337	13	18	13	22	The impacts of climate change adaptation and mitigation options should also be considered in the context of climate change impacts [, Gambia]	This is addressed especially in section C and in Figure SPM4
8823	13	18	13	22	Related to climate change adaptation and mitigation, is important to include strategies of SLM (Reference: http://www.fao.org/land-water/land/sustainable-land-management/es/) [Jean-Luc Chotte, France]	Sustainable land management is one of the three categories introduced for the response options addressing climate change adaptation and mitigation
25929	13	20	13	20	A glossary of abbreviations would be very useful. [, France]	Abbreviation was avoided
17161	13	20	13	20	"This will also address the SDGs...": define sustainable development goals (write it in extenso next to the acronym SDG), since this is the first occurrence of the acronym in the chapter. [Renaud Toussaint, France]	Abbreviation was avoided
38321	13	20	13	21	As IPCC reports do not provide recommendations, the verb should be in the conditional tense: "This WOULD address the SDGs..." [, United States of America]	The verb can has been used
8851	13	20	13	21	specify SDGs in question (2, 6,6, 15) [Jean-Luc Chotte, France]	These are detailed in the section of Chapter 6 cited in reference
13117	13	21	13	21	referece to "Afforestation" here is not a good example. Afforestation of non-forest lands will decrease biodiveristy and reduce albedo. [David Cooper, Canada]	This sentence has been revised and the wording clarified
2141	13	21	13	21	Not clear why afforestation was chosen as the example. Avoided deforestation is likely to have much greater benefits, at least in the short to medium-run. [David Kaimowitz, Nicaragua]	This sentence has been revised and the wording clarified
30385	13	21	13	21	B1.3 please add 'ecosystems' after 'food' [, Netherlands]	This sentence has been revised and the wording clarified
17803	13	21	13	21	Why afforestation and not reforestation? [Quentin Lejeune, Germany]	This sentence has been revised and the wording clarified
32383	13	21	13	21	Afforestation as currently defined by the Marrakesh Accords can have both negative and positive impacts on the local and global climate, as described in detail in Chapter 2 (2.6.2.1). The example is therefore inappropriate. [Simone Lovera-Bilderbeek, Paraguay]	This sentence has been revised and the wording clarified
2143	13	21	13	22	Should mention that those co-benefits are likely to be location specific. [David Kaimowitz, Nicaragua]	Context specificity is addressed in section B7
14571	13	21	13	22	As noted elsewhere, afforestation at high latitudes is projected to cause local warming, specific to local or reiognal species composition, due to decreases in albedo when snow-covered. [, Canada]	This sentence has been revised and the wording clarified
33889	13	21	13	22	This sentence is somewhat to general. E.g. In high latitudes re/afforestation can causes regional warming during the snowy season due to reductions in albedo. Please consider to be more specific in your example, afforestation is to general since the effect varies from location to location and differs from latitude zones. [, Norway]	This sentence has been revised and the wording clarified
26245	13	22	13	22	Is the cooling mentioned here, cooling with respect to pre-industrial temperatures, or local cooling superimposed on the global warming trend [, Luxembourg]	This sentence has been revised and the wording clarified
30387	13	22	13	22	B1.3 please add 'hydrological restoration' after 'cooling' [, Netherlands]	This sentence has been revised and the wording clarified

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
31561	13	23	13	23	Land use has an essential important role to play [, Brazil]	This sentence has been revised. The broader context of the role of the land sector in mitigation is introduced in section A and is further discussed in section C of the SPM. In B1.1 the role of the land sector for nationally determined contributions to the Paris agreement is mentioned.
6047	13	23	13	24	It would be useful to have a cross-reference to the IPCC SR 1,5 which reveals that all pathways require CDR. [, Poland]	This sentence has been revised and the wording clarified
3925	13	23	13	24	Refer to Box SPM.1 ant the end of the sentence: "... by itself, cf. Box SPM.1." [, Switzerland]	This sentence has been revised and the wording clarified
24427	13	23	13	26	This paragraph is important, but it is too vague. It should stress that land management changes could have adverse effects on food security, biodiversity and other benefits from ecosystems. It needs to link with figure SPM3B. [, Belgium]	This sentence has been revised and the wording clarified
25931	13	23	13	27	This paragraph is of utmost importance and should be kept as it is. [, France]	This sentence has been revised. The broader context of the role of the land sector in mitigation is introduced in section A and is further discussed in section C of the SPM. In B1.1 the role of the land sector for nationally determined contributions to the Paris agreement is mentioned.
24569	13	23	13	27	Most policy makers are aware of this fact but need guidance from science on mitigation and adaptation options' the report should provide guidance on this - e.g., Material in SPM4 could be expanded on in the text and potentially quantified. UNFCCC TP has details [, Ireland]	This sentence has been revised. The broader context of the role of the land sector in mitigation is introduced in section A and is further discussed in section C of the SPM. In B1.1 the role of the land sector for nationally determined contributions to the Paris agreement is mentioned.
4895	13	23	13	27	We would suggest describing the contribution of LULUCF sector here for ensuring the consistency of this paragraph with underlying text. Section 2.7.3 notes that most of the NDCs include land-based mitigation, mainly reduced deforestation and forest sinks. And implementation of country pledges is expected. [, Japan]	This sentence has been revised and the wording clarified
20789	13	23	13	27	B1.4 relates to the role of land in global climate mitigation/adaptation, and thus would fit better in section B3. [, United Kingdom (of Great Britain and Northern Ireland)]	This sentence has been revised and the wording clarified
20793	13	23	13	27	This point starts out being about both adaptation and mitigation but then is only relevant to mitigation- improve clarity in the distinction [, United Kingdom (of Great Britain and Northern Ireland)]	This sentence has been revised and the wording clarified
20791	13	23	13	28	This is a key point and could be elevated. [, United Kingdom (of Great Britain and Northern Ireland)]	This sentence has been revised. The broader context of the role of the land sector in mitigation is introduced in section A and is further discussed in section C of the SPM. In B1.1 the role of the land sector for nationally determined contributions to the Paris agreement is mentioned.
25933	13	24	13	26	We consider this statement as one of the most important message of the SRCCL, highly policy-relevant. We strongly suggest to turn it into a headline message for B1 section of the SPM. [, France]	This sentence has been revised. The broader context of the role of the land sector in mitigation is introduced in section A and is further discussed in section C of the SPM. In B1.1 the role of the land sector for nationally determined contributions to the Paris agreement is mentioned.
4897	13	24	13	26	We would suggest replacing "Without rapid reductions in anthropogenic GHG emissions across all sectors (...)" to "Without anthropogenic GHG emissions reductions (...)". The reasons are as follows: 1) The necessity of "rapid" seems not to be inferred from this sentence; 2) This section argues about the land sector issues, and not all sectors. [, Japan]	This sentence has been revised. The broader context of the role of the land sector in mitigation is introduced in section A and is further discussed in section C of the SPM. In B1.1 the role of the land sector for nationally determined contributions to the Paris agreement is mentioned.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
33891	13	24	13	27	In this very important paragraph please consider to also mention the risk perspective which is mentioned in ch. 7 page 4 line 35-37: "Delaying deep mitigation in the energy sector and shifting burden of mitigation to the land sector increases the risk of adverse effects and mitigation failure." [, Norway]	This sentence has been revised. The broader context of the role of the land sector in mitigation is introduced in section A and is further discussed in section C of the SPM. In B1.1 the role of the land sector for nationally determined contributions to the Paris agreement is mentioned.
29249	13	24	13	27	There is something strange with the second sentence in this para. As stated in the first sentence, land management is insufficient anyway (i.e. independently of what happens with GHGs) [Jan Fuglestvedt, Norway]	This sentence has been revised and the wording clarified
26247	13	25	13	25	Please specify that sectors refer to all human activities, not only the land sector [, Luxembourg]	This sentence has been revised. The broader context of the role of the land sector in mitigation is introduced in section A and is further discussed in section C of the SPM. In B1.1 the role of the land sector for nationally determined contributions to the Paris agreement is mentioned.
17391	13	25	13	25	Managed peat lands could be included as mitigation relevant land area in this list. [Taehyun Park, Republic of Korea]	This sentence has been revised. The broader context of the role of the land sector in mitigation is introduced in section A and is further discussed in section C of the SPM. In B1.1 the role of the land sector for nationally determined contributions to the Paris agreement is mentioned.
6857	13	28	13	28	Add a paragraph that highlights that many of the response options that technically could contribute most to land based mitigation (afforestation, reforestation, and bioenergy) have potentially very substantial adverse effect on food security, livelihood, which makes these response options difficult to reconcile with SDGs. [Markus Giger, Switzerland]	This issue is addressed in the revised section B5
12587	13	1	14	1	Same comment as suggested change for Figure SPM1: Given the importance of dietary change and the reduction of food waste (in addition to losses) in fostering food security, as comprehensively detailed in the body of the report, I think it is essential that these examples are included in Figure SPM4. I therefore strongly recommend adding changing the bullet: Reducing post-harvest losses to : 'Reducing food loss and waste' and adding a bullet: 'Supporting a transition to healthy, low-carbon diets.' I am deeply concerned that without these changes, the critical role of food waste prevention and healthy, low-carbon diets will be lost to policy makers and/or media. [Carina Millstone, United Kingdom (of Great Britain and Northern Ireland)]	Figure SPM 4 and Table SPM 1 of the first draft have been merged and revised (see Figure SPM.3 of the revised draft). Revised Figure SPM.3 includes reduction in food wastes (consumers and retailers), reduction in post-harvest losses and dietary change with mention of their large positive impacts for food security and for some of the other challenges. Dietary changes and reduction in food wastes are mentioned in the revised draft in sections B1, B4, B6 and B7.
27797	13	1	14	21	Since B1 and B2 have a great deal of relevance to the content they deal with, it is possible to communicate more clearly by composing them into one paragraph. [Raehyun Kim, Republic of Korea]	The revised section B1 now incorporates the main points made by sections B1 and B2 in the first draft.
795	13	3	14	4	we believe that land-related options can be classified in other categories, not only the three categories specified in line 4, page 13. From our perspective, this classification could be shown as an example, but as it is presented now, it looks that it is the only possible classification, and that is not true. We believe that the classification should be modified and improved, for example, supply management should be integrated in land management, as they are part of this management practices, while the practices that are included as examples in supply side, should be classified as "value chain management", but not related to supply. We also believe that Figure SPM.4. is confusing, and does not reflect the interlinkages between the different options, and would prefer its deletion. [, Spain]	These categories of response options are presented with further details in Chapter 6 of the report and reference to the corresponding chapter sections is made when introducing these categories in section B.1. The use of supply-side and demand-side subcategories has been clarified in Fig. SPM3

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6437	13	14	14	17	In addition to synergy between adaptation and mitigation, it should also be mentioned that some mitigation actions may have synergetic benefits but also trade-offs with other environmental concerns, such as nutrient leaching. It is important that measures capitalize on synergies and avoid trade-offs as much as possible [, Denmark]	Further details on synergies and adverse side-effects of response options are presented in Chapter 6 and reference to the chapter sections is made
27621	13	27	14	21	Both B1 and B2 address interlinkages between response options. Please streamline these sections avoiding duplications and providing less general/trivial and more concrete statements. [, Germany]	B1 and B2 were revised to avoid duplication. Concrete location specific examples are found in Chapter 6 and reference is made to corresponding sections of this chapter.
29925	13		14		B1 and B2 have overlapping and similar messages and could be merged. The messages are too general here - these need to be supported by facts and concrete examples as much as possible. [, Estonia]	B1 and B2 were revised to avoid duplication. Concrete location specific examples are found in Chapter 6 and reference is made to corresponding sections of this chapter.
20779	13	1	22	22	Throughout section B, a greater distinction need to be made between climate-related mitigation and adaptation and land-related mitigation and adaptation i.e. are they referring to mitigating/adapting to the effect of climate change on the land (such as preventing land degradation at a given level of climate change) or to climate change itself (such as preventing emissions in the first place) [, United Kingdom (of Great Britain and Northern Ireland)]	The first paragraph of section B1 in the revised draft clarifies this point by mentioning five land challenges, including climate change adaptation and climate change mitigation. Therefore, throughout section reference made to adaptation and mitigation challenges points to these challenges of climate change adaptation and climate change mitigation.
38317	13	1	22	22	This section does not adequately distinguish between adaptation and mitigation in practice (e.g., headline statements B1 and B5, B1.1, B1.4, C2.3). Adaptation and mitigation are different processes with different interventions, and it would be helpful to provide policymakers with more concrete examples. [, United States of America]	Sections B1 and B2 provide an overview of response options to interlinked challenges including climate change adaptation and climate change mitigation. The revised Figure SPM.3 shows that some response options have co-benefits for both adaptation and mitigation. Concrete, location specific examples, are not presented in these SPM sections but reference is made to Chapters sections where concrete response options are detailed.
1583	13	3	22	19	Land-related adaptation & migration responses options – [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	Wording was revised here to clarify this statement
1585	13	3	22	19	Global governments could encourage more local, specific response options – in large countries not signed up to the recent Paris agreement & Katowice road map – such as the USA, and ones seemingly now moving away from it, such as Brazil. Encouraged by the UK government, they could see if local, indigenous knowledge streams in both the USA & Brazil could also help provide new, urgently needed response options instead, if the Trump and Bolsonaro-led governments are not able to, or will not, undertake them. Here, the roles at the local level of the USA Environmental Protection Agency (EPA) & those of the many existing ecologically active USA-based businesses, along with knowledge gained from local tribes in Brazil, such as the quilombos & APIB (Articulation of Indigenous People of Brazil) - which have done so much to stimulate pro-green activity in both the USA & Brazil – could be further tapped into to provide valuable insight on ways in which the USA and Brazil could help reduce global warming. Additionally, UK businesses could be encouraged by the UK government to build on brown-field sites only, as we appear to need to reduce the loss of biodiversity on existing green field lands too (B2.2.). This is because it seems important to use all land wisely in future – including such UK land too – which can arguably sometimes be forgotten by UK policy makers using a global lens on such issues. [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	These considerations are not within the scope of the SPM

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
12997	13	1	23	7	There seems to be a reluctance to give a definitive statement that reducing 'food miles' is a good mitigation option. This is true here and elsewhere in the report (5.2.5, 5.3.3, 5.6.4), where trade-offs between the carbon foot print of locally produced food and choice of food is discussed. If this uncertainty is due to a gap in knowledge this should be highlighted as an area in need to research, if not can a more definitive statement be added? [Aidan Farrell, Trinidad and Tobago]	The aim of sections B1 and B2 is to provide an overview of response options to interlinked challenges. Reference is made to Chapter 6, where further specifications concerning each response option are provided together with detailed assessments of potential positive or negative impacts including the role of transportation of food, for which further reference is found in Chapter 5.
33993	13	1	23	7	The issues mentioned in the executive summary of chapter 6 are insufficiently represented in the SPM section B, and references should to chapter 6 should be made more explicit, goint to chapter level 3 wherever possible (now, mostly reference is made to e.g. 6.5). [Elke Stehfest, Netherlands]	Reference is made in the revised section B of SPM to several sections of Chapter 6.
33997	13	1	23	7	While chapter 6 uses the concept of reponse options to all challenges wll affect all challenges, SPM singles our response options for adaptation and mitigation. If this is done intentionally, at least also the broad pricture should be mentioned in one paragraph. e.g. like not only do response options for adaptation and mitigation affect the broad range of land challenges, also response options to food security desertification and degradation will affect.... [Elke Stehfest, Netherlands]	Response options to desertification, land degradation and food insecurity are now discussed under sections B2, B3 and B4 respectively. Section B1. clarifies that response options to five interlinked challenges are addressed.
30403	13	1	23	7	B-section: This section does not pay enough attention to the mitigation potential that halting deforestation (and the degradation of forests and other terrestrial ecosystems) would provide. This subject deserves a separte sub chapter B.x in which attention could be paid to the regional drivers of deforestation that differ form South America, to Africa to south Eas Asia. Also include a map of the regional scale of deforestation and the follow up land use that can be identified as driver. [, Netherlands]	The aim of sections B1 and B2 is to provide an overview of response options to interlinked challenges. Reduced deforestation and forest degradation large potential for mitigation is shown in revised Fig SPM3 and B1 and B3 sections. Reference is made to Chapter 6, where further specifications concerning each response option are provided together with detailed assessments of potential positive or negative impacts including the role of deforestation and corresponding drivers.
3919	13	1	23	7	Section B does not clearly separate mitigation and adaptation measures. Policymakers would need more clarity on what is mitigation and what is adaptation, among ohter reasons because national legislation on GHG emission reductions, national and international commitments, cooperation, financing, reporting, etc. Therefore, even if it is difficult because the intricacy of the actions and their result, this section should aim at presenting mitigation measures separated from adaptation measures. [, Switzerland]	Sections B1 and B2 provide an overview of response options to interlinked challenges including climate change adaptation and climate change mitigation. The revised Figure SPM.3 and subsections in B show that a number of response options have co-benefits for both adaptation and mitigation. Section C deals with policies, governance and socio-economics, which are not the focus in section B.
8605	13	1	23	7	All this section uses terms that are vague (land management, crop management , livestock management, grazing land management, etc... These terms cover a lot of possible actions, some of them realistic and feasible, some of them generating negative suide effects and unrealistic. Sentences and tables using these terms without more specifications risk to be misinterpreted. [Marc Aubinet, Belgium]	The aim of sections B1 and B2 is to provide an overview of response options to interlinked challenges. Reference is made to Chapter 6, where further specifications concerning each response option are provided together with detailed assessments of potential positive or negative impacts.
8607	13	1	23	7	Mitigation of carbon sources in agriculture are always calculated in absolute values (Gt CO2 yr-1) which is irrelevant.For example, a country that would reduce its emissions by reducing its herd size and pastures areas would see the impact of its agriculture decrease but it should compensate by importing meat and milk from foreign countries which is ninsense at global scale. To avoid this, mitigation should be computed in terms of emissions per unit of food (mass or energy) produced. [Marc Aubinet, Belgium]	Sections B1 and B2 do not address socio-economics, which is addressed together with policies (including agricultural policies) in section C. The focus of section B is on response options addressing interlinked challenges including climate change mitigation. Risks of emission leakage (i.e. reduction of land based emissions in one region and corresponding displacement of production and associated emissions into another region) are addressed in Chapters 5 and 7 of the assessment.

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20795	13		28		There could be more clarity on the extent to which overall adaptation responses/ objectives conflict or have synergies with those that relate to mitigation, desertification, degradation and food security. There seems to be lots of evidence either way and I know it is a complex and context specific picture but it would be good to have some kind of plain english summary on this. [, United Kingdom (of Great Britain and Northern Ireland)]	Co-benefits and adverse side-effects of response options across challenges are systematically addressed in the revised SPM Table 3. Some of the interactions are also highlighted in section B text.
4245	13	2			Delete ". Response option" so the two sentences are merged into one. [Ralph Sims, New Zealand]	This wording has been revised
4247	13	2			Fig SPM 4 not referred to in text. Caption states "Integrated response options assessed in this report" but it is really only related to food and forest production. Nothing on degradation, desertification, biodiversity loss. Revise caption accordingly. Delete ". Response option" so the two sentences are merged into one. WATER not mentioned in the figure, yet is discussed throughout the text. A key technology to reduce water and nutrient demand is through "precision agriculture" soAnimal farming intensity" this should be included an example under "Agricultural management" and could displace "and grazer stocking density" which will have lower impacts. Better to call it " Animal farming intensity" [Ralph Sims, New Zealand]	Figure SPM 4 and Table SPM 1 of the first draft have been merged and revised (see Figure SPM.3 of the revised draft). Revised Figure SPM.3 includes integrated water management (in the agriculture section). Improved livestock management and improved grazing management are the main response options relevant for animal farming in this table and in corresponding text sections.
23259	13	4			This categorisation makes no real sense to me. Surely risk management is practiced across both the land management aspects and the value chain aspects (indeed almost all of the examples used in the Table under the 'Land management' and 'Value chain' headings could be termed risk management). Furthermore, the land components are just part of the value chain. The separation of response options into some framework is quite sensible but needs a different classification. An alternative framework is just 'on-farm' and 'off-farm'. I guess you could split 'off farm' into industry and policy components (but arguably industry does have policy too) or instead call the 'risk-management' category 'Institutional responses' instead (see comment on the related table). Or split it into 'supply' and 'demand' components – and then this would be consistent with later discussions in the SPM. It is important to find out from governments what framework best informs their decision-making. This framework then needs to be ported into the subsequent text, figures and tables. [Mark Howden, Australia]	These categories of response options, including value chain, are presented with further details in Chapter 6 of the report and reference to the corresponding chapter sections is made when introducing these categories in section B.1. Since the report does cover all forms of land use, categories pertaining to on farm and off farm responses would not be covering all response types. Supply-side and demand-side responses are introduced in the supply-chain management category.
27793	13	7			Replace 'between' into 'among'. [Raehyun Kim, Republic of Korea]	This sentence has been revised and the wording clarified
16447	13	8			Figure SPM 1-->Figure SPM 4? [, Republic of Korea]	This sentence has been revised and the wording clarified
2089	13	11			Robust Evidence/high agreement [Tomas Molina, Spain]	This sentence has been revised and the wording and uncertainty statement clarified
20787	13	15			Not sure that policy makers will understand the term "agro-climatic". Please either define or replace with a layman's term. [, United Kingdom (of Great Britain and Northern Ireland)]	This wording has been revised
30933	13	16			Increasing biodiversity in general, not just on agricultural land, leads to both adaptation and mitigation outcomes [Kelsey Perlman, France]	This is addressed in further details in Chapter 6 and reference to corresponding sections is made
2091	13	20			Robust Evidence/high agreement [Tomas Molina, Spain]	Uncertainty statement has been checked
16449	13	21			e.g., afforestation-->afforestation and reforestation [, Republic of Korea]	This sentence has been revised and the wording clarified
16451	13	22			Please add "Furthermore reforestation enhance the capacity of disaster risk reduction significantly". [, Republic of Korea]	This sentence has been revised and the wording clarified

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
15891	13	24		27	this is really important and I would renumber it in B1.1!!Or even write it at the very beginning of the SPM as a Preamble to the rest of the document.See Baldocchi and Penuelas 2018. Global change biology. The Physics and Ecology of Mining Carbon Dioxide from the Atmosphere by Ecosystems. [Caroline Vincke, Belgium]	This sentence has been revised. The broader context of the role of the land sector in mitigation is introduced in section A and is further discussed in section C of the SPM. In B1.1 the role of the land sector for nationally determined contributions to the Paris agreement is mentioned.
27619	13	26			Please mention all three objectives of the Paris Agreement outlined in its Article 2, not only mitigation, because none of these objectives can be reached under unabated warming scenarios. [, Germany]	This sentence has been revised. The broader context of the role of the land sector in mitigation is introduced in section A and is further discussed in section C of the SPM. In B1.1 the role of the land sector for nationally determined contributions to the Paris agreement is mentioned.
23027	14	1	14	1	The figure is useful because it places practical examples in a coherent framework and appears to be the start of a systematic planning framework that could be useful to policymakers. However, it is also problematic because it does not address the interlinkages at lower categories (each example contributes to more than one 'sub-class'). This supports linear approaches when more integration and systems thinking would be necessary. Is it possible to elaborate on how this framework could be used in practice and in a manner that accommodates interlinkages (e.g. drawing diagonal lines between the categories and sub-categories)? Also, the figure's categorisation is also used unevenly in the following text (only three of the five land management categories are explored). [Anastasios Kentarchos, Belgium]	Figure SPM4 removed from the SPM
33569	14	1	14	1	"Enhancing pollution services"? What is meant by that? [Andreas Fischlin, Switzerland]	Figure SPM4 removed from the SPM
15303	14	1	14	1	Suggest the land management sub groups in the figure should better reflect the strong interaction between each of the groups. For example, agricultural management practices include weed management, stocking and cropping practices that enhance ground cover and reduce loss of or increase soil organic matter and thus soil carbon, retain water etc. [, Australia]	Figure SPM4 removed from the SPM
31563	14	1	14	1	figure: (soil management) managing soil erosion > adopting soil conservation initiatives [, Brazil]	Figure SPM4 removed from the SPM
31565	14	1	14	1	figure: (risk management) early warning systems and contingency plans; (...); visions and pathways analysis and reduction of vulnerabilities [, Brazil]	Figure SPM4 removed from the SPM
27623	14	1	14	1	In addition to "restoring wetlands", the example "conservation of intact peatlands" should be added under "other environmental management". This is a key measure in terms of climate relevance, equivalent to "reduce deforestation". Peatlands appear to be an undervalued topic and should be more highlighted. [, Germany]	Figure SPM4 removed from the SPM
5483	14	1	14	1	Among adaptation and mitigation response options there could be more emphasis on decreasing food consumption and food waste and on the importance of short food supply chains. Global trade results more food waste. [, Hungary]	Figure SPM4 removed from the SPM
23779	14	1	14	1	Fig 4: risk management....in second step agin risk management is given. Consider giving Forewarning and Safetynets [, India]	Figure SPM4 removed from the SPM
3337	14	1	14	1	it is important to consider explicitly arid and semiarid ecosystems in land management option [, Mexico]	Figure SPM4 removed from the SPM
30389	14	1	14	1	Figure SPM 4: under 'land management' water of hydrological management is missing and should be added for it is essential [, Netherlands]	Figure SPM4 removed from the SPM

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
33895	14	1	14	1	Figure SPM 4: How does this figure link to sustainability in the different management categories. Please consider to find ways to communicate potential for sustainable management in the figure? Please also consider to include "water management" as a component of land management since it plays a significant role to prevent land degradation, for securing food production and stability for ecosystems. [, Norway]	Figure SPM4 removed from the SPM
6049	14	1	14	1	(Figure SPM 4.) Beneficial to add: sustainable forest management practices to encompass the broad range of activities, such as fire management and understory planting. This is also highlighted on p.15 [, Poland]	Figure SPM4 removed from the SPM
17581	14	1	14	1	Figure SPM.4 - Under "Other Environmental management", "Enhancing pollution services" sounds a bit curious. Perhaps redraft? [, Sweden]	Figure SPM4 removed from the SPM
20797	14	1	14	1	This figure is helpful to illustrate examples of response options, and should thus be explicitly referenced in section B1 [, United Kingdom (of Great Britain and Northern Ireland)]	Figure SPM4 removed from the SPM
20799	14	1	14	1	The example of food transport and distribution needs more explanation on what the response is [, United Kingdom (of Great Britain and Northern Ireland)]	Figure SPM4 removed from the SPM
27907	14	1	14	1	It should be made clear that the list of examples under the response options are not exhaustive. [Itchell Guiney, South Africa]	Figure SPM4 removed from the SPM
6121	14	1	14	1	We're asking where to find the LDN issue this figure SPM 4?. It would be good to highlight it. [Jacques-Andre Ndione, Senegal]	Figure SPM4 removed from the SPM
29743	14	1	14	1	(Figure SPM-4.) Under 'Risk management' it would be more complete if you would include 'Improve climate and weather information services, seasonal forecasts' as well as 'early warning systems'. [Mairi Dupar, United Kingdom (of Great Britain and Northern Ireland)]	Figure SPM4 removed from the SPM
6671	14	1	14	1	Fig SPM 4, under "forest management" there is no mention of biodiversity. Forests are of course not only trees alone, and biodiversity mainstreaming can help with adaptation. In a similar vein, one may even be encouraged to consider the threats of wildlife harvesting and trade to the forest dynamics. [Mochamad Indrawan, Indonesia]	Figure SPM4 removed from the SPM
6673	14	1	14	1	Fig SPM 4, under "targeted decarbonization" mentioned "large scale afforestation" as example of strategy. Previously, in a similar vein "afforestation" was mentioned as a viable co-benefit mechanism (p13, line 21). However, one wonders if on the global scale afforestation is a more viable option compared to ecosystem restoration (including rehabilitation). In moist forest covered Indonesia, for example, reforestation, rehabilitation, and restoration are more feasible option compared to afforestation [Mochamad Indrawan, Indonesia]	Figure SPM4 removed from the SPM
25259	14	1	14	1	Fig 4: risk management....in second step again risk management is given. Consider giving Forewarning and Saftynets [Naresh Kumar Soora, India]	Figure SPM4 removed from the SPM
17163	14	1	14	1	Line 3, column 5, "Bioenergy and BECCS": introduce the extended version of acronym BECCS [Renaud Toussaint, France]	Figure SPM4 removed from the SPM
15707	14	1	14	1	Figure SPM4. Why Risk management is not broken down to different subthemes like 'Land management' and 'Value chain management'? There is term "Enhancing pollution". I don't understand, please clarify. [Tuomo Kalliokoski, Finland]	Figure SPM4 removed from the SPM

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32385	14	1	14	2	Per definition, bioenergy use causes CO2 emissions, so it cannot be classified as a de-carbonization option. Whether bioenergy production in combination with use has a positive impact on climate change is disputed, some studies point out that it causes more GHG emissions than most types of fossil fuels if both the pay-back time and direct and indirect land use change are taken into account (Searchinger et al., 2017, see also Sterman et al., 2018). Similarly, whether large-scale afforestation contributes to climate change mitigation depends on the species that are used and the impacts of the direct and indirect land use change it triggers. See also Dellasella, in press. The findings of Chapter 4 (4.7.2 and 4.7.4) should be better reflected here as well. [Simone Lovera-Bilderbeek, Paraguay]	Figure SPM4 removed from the SPM
32503	14	1	14	2	Sterman, J.D., Siegel, L. and Rooney-Varga, J.N., 2018. Does replacing coal with wood lower CO2 emissions? Dynamic lifecycle analysis of wood bioenergy. Environmental Research Letters, Volume 13, Number 1. [Simone Lovera-Bilderbeek, Paraguay]	Figure SPM4 removed from the SPM
24671	14	1	14	3	Food waste can be a source of energy, nutrients etc. [, Ireland]	Figure SPM4 removed from the SPM
24673	14	1	14	3	Consider including food processing in the supply management chain in Fig. SPM4 [, Ireland]	Figure SPM4 removed from the SPM
33893	14	1	14	3	In level 2 of the figure "Targeted decarbonation" seems to be of a different nature than the other management categories. For us it seems that Targeted decarbonisation would fit better under both Forest management and soil management as examples of important mitigation options, rather than directly under Land management. [, Norway]	Figure SPM4 removed from the SPM
1687	14	1	14	3	soil management can not be listed with agriculture management that changed to crop management [guosheng wang, China]	Figure SPM4 removed from the SPM
8873	14	1	14	3	SPM Figure 4: Under Land Management : Another box entitled " Urban Land Management" [Jean-Luc Chotte, France]	Figure SPM4 removed from the SPM
14487	14	1	14	3	This figure needs another arrow-lines from Risk management to Land management and Value chain management [Shuzo Nishioka, Japan]	Figure SPM4 removed from the SPM
14489	14	1	14	3	Considering deep mutual relation between landuse and biodiversity, there should be some explanation why biodiversity does not appear explicitly in this chart. [Shuzo Nishioka, Japan]	Figure SPM4 removed from the SPM
33897	14	1	14	4	Figure SPM 4: Factors listed in the other environmental management, what does enhancing pollution services mean? Instead, enhancing pollination services. Please consider to include the pollution dimension as well by including "reducing water/soil pollution if appropriate. [, Norway]	Figure SPM4 removed from the SPM
13119	14	1	14	7	Figure SPM 4 and KM B2. The three way classification is fine, but the name of the second "Value-chain management" is not. For 2 reasons. 1 "value-chain" implies the supply chain (and businesses so comprised), but individual behaviour lies outside this. 2 this category excludes the consumption side but excludes the production side which is included under "land management". Perhaps something along the lines of "wider food system" might be better [David Cooper, Canada]	Figure SPM4 removed from the SPM
13121	14	1	14	7	Figure SPM 4 and KM B2. The three way classification is fine, but potential role of land restoration (including A/r, ecosystem restoration, ag land rehabilitation) is dispersed under other headings and somewhat lost. Moreover the presentation is very sectoral (while the underlying chapter argues for a cross-sectoral approach). [David Cooper, Canada]	Figure SPM4 removed from the SPM
23025	14	1	14	21	4 out of 5 land management options (see Figure SPM 4 on Integrated Response Options) are useful also on the CBD and CCD context. This should be highlighted in an additional key message. [Anastasios Kentarchos, Belgium]	Figure SPM4 removed from the SPM

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
14573	14	1	14	21	Figure SPM.4: The Risk Management Column is lacking information. Suggest adding a bullet 'integrated policy/program response system'. The figure is also missing the social licence aspect of the value chain management (e.g. food processors demanding certain production practices from farmers due to consumer preferences for sustainably produced food. Not just limited to dietary preferences.) [, Canada]	Figure SPM4 removed from the SPM
2145	14	2	14	2	Unclear why land tenure is under risk management, except that the authors couldn't figure out where else to put it. [David Kaimowitz, Nicaragua]	Figure SPM4 removed from the SPM
17351	14	2	14	2	Figure SPM 4 is never referred to in the text [Maria Helena Cruz de Carvalho, France]	Figure SPM4 removed from the SPM
17395	14	2	14	3	This graph seems rather incomplete. Issues concerning ecological integrity are not well reflected. The protection of carbon stocks in intact ecosystems and measures to protect and support biodiversity to ensure healthy ecosystems are missing. Further, the issues of resilience of ecosystems and their ecosystem services to combat further land degradation are not reflected in this graph. The section of 'targeted decarbonisation' justifies again the large scale deployment of bioenergy as non-sustainable energy source that will have multiple negative side effects on people and biodiversity like land conflicts, biodiversity impacts, decrease of landscape resilience through monoculture energy crops, etc. Further, it justifies BECCS as a technology solution that has not even been proven in scale and that so far, and most presumably in the future will suffer under fast problems with accounting and leakages. Measures to reduce the demand for short lived wood based products and a the establishment of a better cascade use cycle of land based products before their use as bioenergy fuel could be added demand management. The strongest risk management should be the restoration of ecosystems to ensure the resilience of ecosystem services and landscapes to climate impacts. [Taehyun Park, Republic of Korea]	Figure SPM4 removed from the SPM
2029	14	2	14	3	To aid the reader, I suggest authors indicate in the caption the significance of the colours of the boxes. [William Lahoz, Norway]	Figure SPM4 removed from the SPM
8795	14	2	14	21	Fig. SPM.3: Clarification required: Why hasn't water management been specifically included under 'Land mangement'? Essentially it is the availability of water (aridity index) in a biome that also led to the separation between chps. 3 and 4. Also the issue of water is intrinsically linked to climate change, and thus to discussions on land-based mitigation and adaptation options. An IPCC special report on 'climate change and land' and its SPM should specifically address this issue. [Jean-Luc Chotte, France]	Figure SPM4 removed from the SPM
30093	14	5	14	7	From table SPM1 it follows that all but a few response options have co-benefits and thus do not exacerbate other problems. So we suggest to rephrase into: "Options that address a single land challenge may exacerbate other problems, but generate co-benefits in most cases (SPM1)" (or something like that) [, Netherlands]	This paragraph has been revised and reworded
38323	14	5	14	7	The statement in B2 that options that address a single land challenge may exacerbate other problems is an important point. The trade-offs involved in land use and land management decisions could be emphasized more in the SPM. [, United States of America]	Co-benefits and adverse side-effects of response options across challenges are systematically addressed in the revised SPM Table 3. Some of the interactions, synergies and trade-offs, are also highlighted in section B text.
1587	14	5	14	21	Integrated response options – [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	Reworded

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1589	14	5	14	21	The scale of the human crisis unfolding here appears immense, with between 5 million human lives lost per year now, and up to 100 million human lives lost by 2030 (Table SPM 1). As such, the UK government may have an ethical or moral duty to ensure that UK businesses know such figures, so they better comprehend & grasp the scale of this problem globally, and put in place action plans into their CSR efforts to help the people concerned, which could well include some of their own staff. [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	This is not part of the scope of this SPM
26035	14	6	14	6	This sentence is not very explicit, as the land challenges are not explained or denominated. [, France]	This message is now conveyed under B1, which mentions explicitly the five challenges
27627	14	6	14	6	Please check the frequent use of "negative language", and replace if possible by more neutral or solution-oriented language: Instead of "Options that address a single land challenge may exacerbate other problems." just say it in a positive manner: "In order to deploy positive effects on different land challenges, a strategic combination of response options has to be implemented, and trade-offs between land challenges have to be considered. [, Germany]	This paragraph has been revised and reworded
13443	14	6	14	7	Please revise to drive home the message that there should be integrated response options should be integrated to avoid midadaptation. [Lourdes Tibig, Philippines]	This message is now conveyed under B1.
30085	14	8	14	8	A comma is missing between '6.4' and '6.5'. [, Netherlands]	This paragraph has been revised and reworded
30089	14	8	14	8	Refer to SPM 4 since it summarizes the adaptation and mitigation response options in the three categories mentioned. [, Netherlands]	This paragraph has been revised and reworded
8797	14	8	14	8	Shouldn't it read "Climate change adaptation strategies"? [Jean-Luc Chotte, France]	This paragraph has been revised and reworded
25937	14	8	14	9	The focus on adaptation is not justified here and a better balance between mitigation and adaptation should be proposed. [, France]	This message is now conveyed under B1, which mentions explicitly the five challenges
7261	14	8	14	11	An assessment of this bullet point is required. [Debra Roberts, South Africa]	This paragraph has been revised and reworded
31567	14	8	14	11	The concept of co-benefits between adaptation and mitigation is well understood and acceptable, but the reference in the end of this paragraph is misleading and unbalanced. "Nevertheless, there are limits of adaptive capacity." This is not what been discussed in the paragraph, of course there is limit to everything, to mitigation as well. I strongly recommend that the sentence be rephrased to include "Nevertheless there are limits to such co-benefits, therefore specific adaptation and mitigation actions should not be undermined". [, Brazil]	This paragraph has been revised and reworded
3023	14	8	14	11	An uncertainty qualifier would be appropriate for the whole statement. [, Russian Federation]	This paragraph has been revised and reworded
29639	14	8	14	11	The existence of limits to adaptation and associated losses was highlighted in the SR1.5, and this report should provide additional information from the land perspective. [, Saint Lucia]	Limits to adaptation are assessed under B2.5
797	14	8	14	11	this paragraph does not include any confidence level. Either it is added or the paragraph should be deleted. [, Spain]	This paragraph has been revised and reworded
20801	14	8	14	11	How does limits to adaptive capacity follow the co-benefits of adaptation strategies? Please clarify. [, United Kingdom (of Great Britain and Northern Ireland)]	This paragraph has been revised and reworded
22095	14	8	14	11	B2.1-Please check: kindly provide confidence statement. [Suvadip Neogi, India]	This paragraph has been revised and reworded
24571	14	8	14	23	This is too generic to be useful to policymakers. Please elaborate and quantify, or delete [, Ireland]	This paragraph has been revised and reworded
18139	14	9	14	10	It is not clear why this constitutes an example for mitigation co-benefits. [Astrid Schulz, Germany]	This paragraph has been revised and reworded

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31569	14	10	14	10	(...) a typical feature of smallholder farming systems - : the assumption that smallholder farming systems are diversified in their crop systems and income is not valid. There are many large farms that adopt similar strategy, by integrating production, and the opposite, smallfarms that adopt monoculture and are highly unsustainable. Further stressing such stereotypes makes the work on public policies and technical assistance much more difficult. [, Brazil]	This paragraph has been revised and reworded
6339	14	10	14	11	This sentence on limits to adaptive capacity would be more useful if it were expanded. What limits already exist? How might these change in the future? How might they be avoided or what can we do about them? [, Gambia]	This paragraph has been revised and reworded
17577	14	10	14	11	It might be useful to complement the last sentence, what is the implication and/or at which levels of warming are such limits encountered? [, Sweden]	This paragraph has been revised and reworded
20803	14	10	14	11	Not clear how the limits to adaptive capacity relate to the co-benefits. Please clarify. [, United Kingdom (of Great Britain and Northern Ireland)]	This paragraph has been revised and reworded. Limits to adaptation are assessed under B2.5
799	14	12	14	12	in this line, we propose to add "if not managed sustainably" after "Land is a finite resource". With sustainable management, resources will be renewed constantly. [, Spain]	This paragraph has been revised and reworded
11645	14	12	14	13	IPCC certainty language is missing [Linah Ababneh, Sweden]	This paragraph has been revised and reworded. The revised Figure SPM.4 provides an assessment of illustrative pathways linking policy, land use and climate change. For contrasted SSPs, estimated changes in land use, in carbon and food prices and in AFOLU net emissions (including land-based carbon sinks) are shown with their corresponding uncertainties. This Figure is placed in section C of the SPM since land use change is affected both by biophysical and to socio-economic dimensions, including policies that may enable response options.
40285	14	12	14	13	this paragraph may cause some confusion, due to the concept of managed land applied for inventory purposes following the IPCC Guidelines. Land can be called managed even if within natural (foest) domain (e.g., in the case of Brazil, conservation units with natural forests are considered managed land if created by law). [Thelma Krug, Brazil]	This paragraph has been revised and reworded. The revised Figure SPM.4 provides an assessment of illustrative pathways linking policy, land use and climate change. For contrasted SSPs, estimated changes in land use, in carbon and food prices and in AFOLU net emissions (including land-based carbon sinks) are shown with their corresponding uncertainties. This Figure is placed in section C of the SPM since land use change is affected both by biophysical and to socio-economic dimensions, including policies that may enable response options.
23029	14	12	14	14	Replace sentence with the following: "Land is a finite resource and further expansion of managed land into natural ecosystems will lead to the increase of societal challenges, loss of both above- and below-ground biodiversity and substantive ecosystem services." [Anastasios Kentarchos, Belgium]	This paragraph has been revised and reworded. The revised Figure SPM.4 provides an assessment of illustrative pathways linking policy, land use and climate change. For contrasted SSPs, estimated changes in land use, in carbon and food prices and in AFOLU net emissions (including land-based carbon sinks) are shown with their corresponding uncertainties. This Figure is placed in section C of the SPM since land use change is affected both by biophysical and to socio-economic dimensions, including policies that may enable response options.

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6439	14	12	14	15	Countries with a high share of agricultural land can reduce the effects of water and air pollution by intensification of agriculture in more resilient areas and reducing in vulnerable areas. Intensification can also free up more land for other purposes. Thus intensification can be an appropriate strategy provided that it is targeted and the necessary mitigation and adaptation measures are implemented in both areas where intensification takes place and areas where it is reduced [, Denmark]	This paragraph has been revised and reworded. The revised Figure SPM.4 provides an assessment of illustrative pathways linking policy, land use and climate change. For contrasted SSPs, estimated changes in land use, in carbon and food prices and in AFOLU net emissions (including land-based carbon sinks) are shown with their corresponding uncertainties. This Figure is placed in section C of the SPM since land use change is affected both by biophysical and to socio-economic dimensions, including policies that may enable response options.
27629	14	12	14	15	If more food is needed, both expansion of production into natural ecosystems and further intensification on existing managed land are described to be negative. What is the solution then? Is intensification really always bad, and what about "sustainable intensification"? Please draw on the assessment of potential solutions provided in the underlying report, in particular chapters 6 and 7. The ES of chapter 6-20 for example mentions one: "Other options that can be applied without changing the use of the land, for example measures to increase the soil organic matter (carbon) content of soils, are not limited by land competition constraints (robust evidence; high agreement)". [, Germany]	This paragraph has been revised and reworded. The revised Figure SPM.4 provides an assessment of illustrative pathways linking policy, land use and climate change. For contrasted SSPs, estimated changes in land use, in carbon and food prices and in AFOLU net emissions (including land-based carbon sinks) are shown with their corresponding uncertainties. This Figure is placed in section C of the SPM since land use change is affected both by biophysical and to socio-economic dimensions, including policies that may enable response options.
30235	14	12	14	15	Further intensification on existing managed land risks exacerbating water and air pollution and increasing land degradation and desertification', but not necessarily. If intensified sustainably (SLM, closing the yield gap), intensification will significantly reduce natural land conversion and accompanying loss of C in soils and biomass, water holding capacity, biodiversity and risk of an ever-perpetuating spiral of CC and LD. The biggest loss of Carbon, biomass, water holding capacity, and biodiversity is in the 1st stage of conversion of natural land into extensive agriculture (minus ~ 50-80%). The loss in the 2nd stage, intensification of extensive agriculture, is much smaller (an additional ~ 10%) while yields/ha may rise a factor 2 to 10. This means that sustainable land use intensification is much more favorable than extensification/expansion. See also Chapter 7 from the IPBES Land Degradation and Restoration Assessment (LDRA), and the SPM of the LDRA. [, Netherlands]	This paragraph has been revised and reworded. The revised Figure SPM.4 provides an assessment of illustrative pathways linking policy, land use and climate change. For contrasted SSPs, estimated changes in land use, in carbon and food prices and in AFOLU net emissions (including land-based carbon sinks) are shown with their corresponding uncertainties. This Figure is placed in section C of the SPM since land use change is affected both by biophysical and to socio-economic dimensions, including policies that may enable response options.
30391	14	12	14	15	Figure SPM 4 or in text B2.2: another important point for supporting resilience in nature/ecosystems and wild/natural species management and sustaining biodiversity, especially for adaptation to a changing climate governance should be directed to interconnectivity of a nature/ecosystem network (meta-level) at a landscape scale. If natural ecosystems are fragmented and degraded the risk increases for ecosystem collapse. This risk can be reduced by organising interconnectivity of otherwise isolated ecosystems. In that way meta-populations of species have a better chance to survive at a landscape level and can recolonize patches and stretches where they have disappeared. [, Netherlands]	This paragraph has been revised and reworded. The revised Figure SPM.4 provides an assessment of illustrative pathways linking policy, land use and climate change. For contrasted SSPs, estimated changes in land use, in carbon and food prices and in AFOLU net emissions (including land-based carbon sinks) are shown with their corresponding uncertainties. This Figure is placed in section C of the SPM since land use change is affected both by biophysical and to socio-economic dimensions, including policies that may enable response options.
4397	14	12	14	15	We support the inclusion of this material in the SPM [, New Zealand]	This paragraph has been revised and reworded. Fig SPM4 provides illustrative pathways showing likely changes in land use

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33899	14	12	14	15	The information on land being a finite resource should be lifted up to para. B2 (in bold), and also highlighted earlier in the SPM. The information here gives additional context and prominence to the statements in SPM paras A1.2 and especially A1.3. Please consider to make an appropriate bold text para that put this vital information together. [, Norway]	This paragraph has been revised and reworded. The revised Figure SPM.4 provides an assessment of illustrative pathways linking policy, land use and climate change. For contrasted SSPs, estimated changes in land use, in carbon and food prices and in AFOLU net emissions (including land-based carbon sinks) are shown with their corresponding uncertainties. This Figure is placed in section C of the SPM since land use change is affected both by biophysical and to socio-economic dimensions, including policies that may enable response options.
33901	14	12	14	15	The paragraph is relevant and it should improve by considering additional information. Example illustrating the suggestion above: B2.2. could be altered to start by saying "Conservation of natural ecosystems and biodiversity is an important mitigation and adaptation response option." Then follows the rest of the current paragraph, stating the scientific justification for the policy advice. [, Norway]	This paragraph has been revised and reworded. The revised Figure SPM.4 provides an assessment of illustrative pathways linking policy, land use and climate change. For contrasted SSPs, estimated changes in land use, in carbon and food prices and in AFOLU net emissions (including land-based carbon sinks) are shown with their corresponding uncertainties. This Figure is placed in section C of the SPM since land use change is affected both by biophysical and to socio-economic dimensions, including policies that may enable response options.
38327	14	12	14	15	The headline statement in B2 notes that options that address a single land challenge may exacerbate other problems. In B2.2 the SPM points out that intensification of existing managed land risks exacerbating water and air pollution and increasing land degradation and desertification. B2.2 also points out that expansion of managed land into natural ecosystems leads to the loss of biodiversity and other ecosystem services, reducing options for adaptation. Left unstated is that either expansion of managed lands or intensification of existing managed lands will be needed to meet growing food demand (as well as provide carbon storage, and supply the bioenergy demanded in mitigation pathways). Furthermore, B5.1 points out the benefits of sustainably and efficiently intensifying the use of land, stating that, "Supply-side mitigation practices in the food system can contribute to climate change adaptation and mitigation by sustainably and efficiently intensifying the use of land and sequestering carbon in soils and biomass." As noted in the headline statement, there are necessary trade-offs in trying to meet the objectives laid out here. [, United States of America]	This paragraph has been revised and reworded. The revised Figure SPM.4 provides an assessment of illustrative pathways linking policy, land use and climate change. For contrasted SSPs, estimated changes in land use, in carbon and food prices and in AFOLU net emissions (including land-based carbon sinks) are shown with their corresponding uncertainties. This Figure is placed in section C of the SPM since land use change is affected both by biophysical and to socio-economic dimensions, including policies that may enable response options.
923	14	12	14	21	It will be advisable here to flag the problem of 'land grabbing', which has been mentioned in Chapter 6. Usurping of land is much more serious problem than being reflected in the SRCCL. One can cite examples of MNCs and foreign governments purchasing large areas of land in Africa and South America. They use all kinds of chemicals- fertilisers and pesticides to get maximum returns from land, least caring for the environment, emissions and health of the local communities. Besides the social tension, such land grabbing creates, it has the potential to lead to widespread social strife and unrest. This needs serious attention of policymakers, and so should be flagged more cogently in the SPM. [Jagdish Kishwan, India]	This paragraph has been revised and reworded. Land tenure issues are addressed in B3.1 and under section C

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31571	14	13	14	13	intensification is a concept that has been used to characterize different outcomes - even within this same document. On the one hand, intensification equals overuse of the land (meaning adopted in this paragraph), where the use of resources is unsustainable, the adoption of confined animal production increases use of energy and animal well being problems, etc. Intensification is also used in other parts of this document to imply a better use of resources, increasing productivity per area, with better resource management and optimized land use, often related to lower pressure on drivers of deforestation. While there is a strong trend in the technical literature to use the term intensification considering the second meaning, we suggest to revise this paragraph, as well as others that adopt the term, clarifying the meaning, or adopting terms that do not lead to potential misunderstandings. [, Brazil]	This paragraph has been revised and reworded. In revised Fig SPM3 it is explained that the increased food productivity response is assumed to be implemented in a sustainable manner. In contrast, revised section B5.3 refers to poorly implemented sustainable intensification which has negative impacts on land degradation.
30101	14	13	14	15	It seems this sentence is contradictory to Table SPM1, since in Table SPM1 it is indicated that 'increase food productivity' has large positive impacts on desertification and land degradation, while statement B2.2 reads: " Further intensification on existing managed land risks exacerbating water and air pollution and increasing land degradation and desertification." [, Netherlands]	This paragraph has been revised and reworded. In revised Fig SPM3 it is explained that the increased food productivity response is assumed to be implemented in a sustainable manner. In contrast, revised section B5.3 refers to poorly implemented sustainable intensification which has negative impacts on land degradation.
20805	14	13	14	15	Sustainable intensification may be necessary to close yield gaps in some regions - this statement could therefore be caveated in some way - see ch6/p48 line 10-17 and p71 and p61 line 15 which states closing yield gaps could impact no less than 1000 million people. [, United Kingdom (of Great Britain and Northern Ireland)]	This paragraph has been revised and reworded. Yield gaps are addressed in section C2.4
6801	14	15	14	15	"Loss of biodiversity also reduces options for future adaptation" has no source and no uncertainty language. In addition, there is no uncertainty language in lines 8-11 and 16-21 on this page. It is recommended to supplement the uncertainty language and keep consistent with the whole report. [Changke Wang, China]	This paragraph has been revised and reworded. Further reference to effects of response options on ecosystem services is provided in sections of chapter 6 cited by SPM
4899	14	15	14	15	The sentence "Loss of biodiversity also reduces options for future adaptation." is hard to understand. It is desirable to add some examples. [, Japan]	This paragraph has been revised and reworded. Further reference to effects of response options on ecosystem services is provided in sections of chapter 6 cited by SPM
17579	14	15	14	15	How does loss of biodiversity (in general?) reduce options for future adaptation? In cases of ecosystem based adaptation? [, Sweden]	This paragraph has been revised and reworded. Further reference to effects of response options on ecosystem services is provided in sections of chapter 6 cited by SPM
3927	14	15	14	15	Write: "Loss of biodiversity and ecosystems also reduces options ...". [, Switzerland]	This paragraph has been revised and reworded. Further reference to effects of response options on ecosystem services is provided in sections of chapter 6 cited by SPM
14427	14	15	14	15	Role of biodiversity needs to be emphasized, considering its fundamental capacity to support land use benefit. [Shuzo Nishioka, Japan]	This paragraph has been revised and reworded. Further reference to effects of response options on ecosystem services is provided in sections of chapter 6 cited by SPM
3929	14	16	14	16	Write: "Impacts of climate change on land may be immediate ...". [, Switzerland]	This paragraph has been revised and reworded.
6123	14	16	14	16	It would be better to write "Impacts may be immediate or may occur over multiple years and can be irreversible." . [Jacques-Andre Ndione, Senegal]	This paragraph has been revised and reworded.
25939	14	16	14	18	We suggest to mention some key findings about the commitments to combat imported deforestation. It would be policy-relevant as there is currently a growing number of zero-deforestation commitments made by States and non-States actors. See GENERAL COMMENT ON SUPPLY CHAIN SUSTAINABILITY MANAGEMENT. [, France]	Sustainable sourcing is mentioned as a response option.
7263	14	16	14	21	An assessment of this bullet point is required. [Debra Roberts, South Africa]	This paragraph has been revised and reworded.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
25941	14	16	14	21	We suggest to give more clarifications on the market mediated land-use change mentioned here, including an explanation of whether and how land grabbing is covered. [, France]	This paragraph has been revised and reworded since socio-economic issues are addressed in section C. Land tenure issues are addressed in B3.1 and under section C
3025	14	16	14	21	Sounds like a textbook. [, Russian Federation]	This paragraph has been revised and reworded.
801	14	16	14	21	this paragraph does not include any confidence level. Either it is added or the paragraph should be deleted. [, Spain]	This paragraph has been revised and reworded.
29745	14	16	14	21	(Paragraph B2.3.) I think it's terrific that the author team has included the 'embodied in trade' point – it's so important. However, I wonder if the way it is described in the SPM might be a bit too subtle for some readers – I'm not sure that all policy-makers will 'get' this point. Could you fit in a very short example to bring this point to life and make this paragraph more impactful? I am suggesting to add a short example to the existing text: 'Many of the trade-offs and synergies associated with managing land are manifested directly at the local level but also indirectly, for example through market mediated land-use change. The ecosystem services and societal impacts embodied in trade are important considerations in the assessment of sustainable land management, mitigation and adaptation actions, as well as the associated costs of these actions and the implications for decision making. {1.3.3, 1.3.2, 1.5.3, 2.7.1, 6.5}' You could, for instance, include a short but generic example here of how 'water-hungry crops may be produced for export in water-scarce regions where climate change is increasing the incidence of drought'. [Mairi Dupar, United Kingdom (of Great Britain and Northern Ireland)]	This paragraph has been revised and reworded since socio-economic issues are addressed in section C. Trade issues are addressed in illustrative pathways in Figure SPM4
22097	14	16	14	21	B2.3-Please check: kindly provide confidence statement. [Suvadip Neogi, India]	This statement is now under B1.4 and a confidence statement has been added
22099	14	16	14	21	B2.3-Please check: Mitigating and adapting to climate change through land management in judicious, rational and sustainable way-the cost of action to be addressed and / or cost of inaction to counteract the drageries of climate change. [Suvadip Neogi, India]	This paragraph has been revised and reworded.
30087	14	18	14	19	It would be helpful to add one or two examples of climate change adaptation and mitigation response options. [, Netherlands]	Societal impacts are addressed under section C. This paragraph has been revised accordingly
20807	14	18	14	19	it's not clear what this sentence means - could "embodied in trade" be deleted? this (I think) would retain the meaning of the sentence while clarifying the language. [, United Kingdom (of Great Britain and Northern Ireland)]	Societal impacts are addressed under section C. This paragraph has been revised accordingly
20809	14	18	14	19	This sentence is unclear, is this about the implications of trade? If so, a suggestion may be: 'The impacts of trade on ecosystem services and society are important considerations in the assessment of the costs and implications of sustainable land management, mitigation and adaptation actions.' [, United Kingdom (of Great Britain and Northern Ireland)]	Societal impacts are addressed under section C. This paragraph has been revised accordingly
4901	14	18	14	21	It may be difficult for readers to understand what kinds of actions are recommended. Please revise explanations and add some examples of actions to facilitate understanding. [, Japan]	Societal impacts are addressed under section C. This paragraph has been revised accordingly
30393	14	18	14	21	B2.3 Consider to change into: The ecosystem services and societal impacts embodied in land management, mitigation and adaptation actions, are important considerations in trade when considering the assessment of sustainability of the agrocommodity chain as a whole (especially when dealing with a critical consumer market). [, Netherlands]	Societal impacts are addressed under section C. This paragraph has been revised accordingly

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
7655	14		14		Figure SPM 4 gives a very unbalanced picture by its dominance on land management which suggests that we can manage our way out of climate change impacts, This is overly optimistic given the findings of the Special Report on 1.5 Degrees. The text in Chapter 7 gives some prominence to risk and this is not well framed here in the SPM. The risk side of this Figure is very underdone. The examples given include risk transfer through insurance, early warning but no adaptive management or transformational change. It would do the text more justice if the risk part of the Figure had several second level boxes to replace "risk management" at that level. For example Early warning / anticipatory actions/ risk transfer/ transformation. Then the next level could have signals and trigger systems/ short term and long term actions and options(adaptive systems)/ insurance and funding/ land use changes and restoration of habitats. The other option would be to make risk management as the supra level of this figure under which the land management and value chain management sit. When one reads on to page 16 it is clear that early warning systems are geared to disaster risk reduction which is not inclusive of impacts of climate change that occur slowly or occur as a result of incremental lower level climate changes that impact in succession without the time to recover. Warning signals are required for them too. [Judy Lawrence, New Zealand]	Figure SPM4 in first draft has been revised and is now integrated in revised Fig SPM3. Risk management options are included in the revised figure with assessment of co-benefits and adverse effects for five land challenges. Further details on risk management options are referred to in Chapter 6
7657	14		14		Figure SPM 4 has a resource use bias to the land management boxes. Biodiversity and habitats are undone as a result. Natural ecosystems some of the second level boxes. And not just as ecosystem services. Ecosystems have a planetary value that is threatened. Other environmental management reads like an oafter thought and contains a mix of things of different types. [Judy Lawrence, New Zealand]	Figure SPM4 in first draft has been revised and is now integrated in revised Fig SPM3. Further details on ecosystem adaptation options and impacts of response options on ecosystem services are referred to in Chapter 6
29819	14		14		Figure SPM4 really doesn't show the interlinkages discussed in the text. [Ley Debora, Guatemala]	Figure SPM4 in first draft has been revised and is now integrated in revised Fig SPM3. This figure shows in a systematic manner co-benefits and adverse effects of response options across land challenges
30831	14		14		Fig 4 I'm not convinced the sub categories of land management are best. What about hydrological / coastl management as a category. NB Note afforestation is in targeted decarbonisation as well as forest management (where I think it belongs). [Mike Morecroft, United Kingdom (of Great Britain and Northern Ireland)]	Integrated water management is a response options included in revised Fig SPM 3
33903	14		18		Consider whether Section B3 could come before Section B2 - important to focus on mitigation in the report. [, Norway]	Sections have been reordered, with section B2 now focused on the interactions with desertification challenge
25935	14	1			We suggest several improvements to this figure: - to add "material substitution" (as in section 6.3.2.10 page 6-38) in the value chain management option - to give in the caption the meaning of BECCS - to delete biochar from the soil management examples as it is not the best example, taking into account that its potential is far lower from the potential of good agricultural practices. such as a combination of low till system, land coverage, and crop rotations. See GENERAL COMMENT ON BIOCHAR - to correct the mention "pollution service" (a word is lacking). [, France]	Figure SPM4 removed from the SPM
27625	14	1			What does "targeted decarbonisation" mean - is this referring to CDR? Please clarify. [, Germany]	Figure SPM4 removed from the SPM
16453	14	1			In Figure SPM 4, Agricultural management Examples, add Stocking organic matter with cultivating. [, Republic of Korea]	Figure SPM4 removed from the SPM
3841	14	1			On figure SPM 4, among the value chain management options, in the demand management column, add a third example: "reducing population pressure". Logically, this additional example ought to come first [Philippe Waldteufel, France]	Figure SPM4 removed from the SPM

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
2489	14	1			Figure SPM 4: Not sure if the expression "Enhancing pollution services" is a very good choice. Maybe rather "pollution reduction services"? [Sigrid Kusch-Brandt, Germany]	Figure SPM4 removed from the SPM
7439	14	1			In Figure 4 use the term "Rehabilitation of rangelands" instead of "Managing invasive species" [tarig Ibrahim, Sudan]	Figure SPM4 removed from the SPM
38325	14	9			"For example, diversifying cropping systems and farm income -- a typical feature of smallholder farming systems -- increases resilience to multiple stresses." It is not clear what the typical "feature" of smallholder farming activities is. Income? Diversification? Maybe these are typical goals of development organizations focused on smallholder farmers? They don't seem to be either features or anything specific to smallholders. Need to rephrase. [, United States of America]	This paragraph has been revised and reworded
2093	14	14			Robust Evidence/high agreement [Tomas Molina, Spain]	This paragraph has been revised.
15893	14	16		21	there are two messages in this section B2.3. 1) the temporality of impacts: direct versus delayed. this is a very important message that could lead to a specific section: evaluating the performance of an adaptation or mitigation strategies implies time (years) 2) the sub section on ES and societal impacts. [Caroline Vincke, Belgium]	Societal impacts are addressed under section C. This paragraph has been revised accordingly
17805	14				Figure SPM4: these seem to be non-exhaustive lists, but ecosystem restoration / peatland restoration are notably missing. [Quentin Lejeune, Germany]	Figure SPM4 in first draft has been revised and is now integrated in revised Fig SPM3, which includes peatland restoration and avoided conversion. Further details on ecosystem based options and impacts of response options on ecosystem services are referred to in Chapter 6
28703	14				B2.2: "Land is a finite resource". This statement should be a basis for all proposed solutions. BECCS, bioenergy and biochar all would require vast added demand for land and hence are not compliant with the factual basis expressed here re finite resources. [Rachel Smolker, United States of America]	Revised section B7 deals with the implications of a finite land resource for bioenergy and BECCS.
27795	14				There are many response options for land management as shown in Figure SPM 1. However some of options are missing in Figure SPM 4. Please address all of response options at least presented in Figure SPM 1. examples in soil management : managing soil erosion → managing soil erosion and actification, add 'SFM' examples in other environmental management : restoring wetlands → restoring wetlands & peatland examples in reis management : land tenure → land tenure and ownership, add 'managing fire' [Raehyun Kim, Republic of Korea]	Figure SPM4 in first draft has been revised and is now integrated together with table SPM1 in revised Fig SPM3, which provides improved consistency
6125	15	1	1	16	Really impressed by the quality of this figures! [Jacques-Andre Ndione, Senegal]	Figure SPM4 in first draft has been revised and is now integrated together with table SPM1 in revised Fig SPM3, which provides improved consistency. Diagrams were simplified
23031	15	1	15	1	The size and direction of some of the arrows is concerning, but overall, this is a good way to summarize key elements. The concepts of "saturation" and "reversibility" require more explanation. [Anastasios Kentarchos, Belgium]	Figure SPM4 in first draft has been revised and is now integrated together with table SPM1 in revised Fig SPM3, which provides improved consistency. For the sake of clarity, the concepts of saturation and reversibility have been omitted from this SPM figure but are discussed in corresponding sections of Chapter 6.
15305	15	1	15	1	Suggest clarifying that while sustainable forest management has no perceived adaptation benefit, sustainable management provides ongoing economic benefit which provides economic resilience and thus is a form of adaptation - it can also be argued that to remain sustainable the system will need to adapt. This is also true for reduced deforestation in the context of ecosystem resilience. [, Australia]	Reduced deforestation and degradation, as well as forest management are presented in revised Fig SPM3 showing co-benefits for adaptation

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
24431	15	1	15	1	Table SPM.1 This table is very "heavily" loaded with information. It should be clarified that when there is no icon (arrow), it means that there is no information, rather than there is no impacts. [, Belgium]	Figure SPM4 in first draft has been revised and is now integrated together with table SPM1 in revised Fig SPM3, which provides improved consistency. Diagrams were simplified
31573	15	1	15	1	On Table SPM 1, Summary of co-benefits A, some impact classification should at least be checked: - taking into account that livestock (and grazing land management) is a very important emitting activity and widespread inside many countries we should expect a great impact on mitigation and also in adaptation; - agro-forestry and all integrated systems is an important way to capture carbon on its forest component and should be also high impactant on mitigation when we think it as an activity that shuold grow in area of adoption; - Reduced deforestation, similar to reforestation, should have impact also in A, D, L and F. They could even be integrated; - Management of invasive species / encroachment should have at least small impact in A, L and F. Otherwise, how come would it be a response option? [, Brazil]	Considered, revised Table SMP3 has been updated
27631	15	1	15	1	Summary of co-benefits, table A): Why "forest management" has no effect on adaptation at all? Good forest management includes wildfire prevention. Also changes in structure and species composition (e.g. diversification, drought resistant species, etc.) are well known adaptation measures. Please revise. [, Germany]	Reduced deforestation and degradation, as well as forest management are presented in revised Fig SPM3 showing co-benefits for adaptation
27633	15	1	15	1	Summary of co-benefits, table A): Soil compaction should have at least a small effect on GHG emissions (N2O from compacted soils). Please revise. [, Germany]	Soil compaction impacts on GHG emissions also need to account for soil organic carbon stock changes and the evidence is not consistent.
27635	15	1	15	1	Summary of co-benefits, table A): Restoration and avoid conversion of peatlands - (1) contribute to adaptation through regulation of water cycle, small or medium, check for consistency with "Restoration and avoid conversion of wetlands"; (2) why peatland conservation is estimated "expensive", and expensive in relation to what: per hectare, per t CO2e GHG abatement, ...? With regards to abatement costs, peatland conservation and restoration is rather cost-efficient. Please revise. [, Germany]	Figure SPM4 in first draft has been revised and is now integrated together with table SPM1 in revised Fig SPM3, which provides improved consistency. The revised cost category estimate for conservation and avoided degradation of peatlands is low.
27639	15	1	15	1	Summary of co-benefits, table A): We are wondering why reduced deforestation and reforestation feature higher costs than afforestation and BECCS. Also it is not clear to us, why reduced deforestation only has benefits for mitigation but no other co-benefits, whereas reforestation and afforestation feature strong co-benefits with the land challenges adaptation, desertification and land degradation. [, Germany]	Figure SPM4 in first draft has been revised and is now integrated together with table SPM1 in revised Fig SPM3, which provides improved consistency. The revised cost category estimate for reduced deforestation, afforestation and co-benefits have been completed and revised.
23781	15	1	15	1	Under improved livestock management the arrow should be bigger for 'Mitigation' (M). As livestock is the one of the major emitter of GHGs. Their feed and shelter management reduce methane emission. [, India]	Figure SPM4 in first draft has been revised and is now integrated together with table SPM1 in revised Fig SPM3, which provides improved consistency. Livestock management impacts on mitigation have been assessed based on threshold values and uncertainties estimated
23783	15	1	15	1	Under Ecosystem-based adaptation, why desertifiaction should go up??? Is there any evidence??? It should go down... [, India]	Figure SPM4 in first draft has been revised and is now integrated together with table SPM1 in revised Fig SPM3, which provides improved consistency. Ecosystem based adaptation is a framework discussed in Chapter 6 but not part of the revised table for the sake of improving clarity.
30091	15	1	15	1	Table SPM1 shows that almost all response options have positive impacts. In SPM1A there are 7 options that have a (large) negative impact on food security. In our opinion, and also confirmed by section 6.5.1 these negative impacts can potentially occur, not necessarily. So, it is a risk, not a fact of life as it is presented now. [, Netherlands]	This issue is addressed in the revised section B5 and linked to the scale of CO2 capture deployment

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
30095	15	1	15	1	Why does reforestation and afforestation have a large negative impact on food security? There is no evidence for this large negative impact as it is always context specific. It highly depends where it is taking place. For example on degraded land it would not impact food security. We would suggest to use the double arrow (i.e. showing that it can be either positive or negative). This is also confirmed by section 6.5.1.18: "However, there are large adverse side-effects for food security due to potential land competition with food production." [, Netherlands]	Potential competition for land for food security is the reason for negative impacts on food security shown in revised Fig. SPM3. Context specificity is addressed in section B7 and in section C
30097	15	1	15	1	Why does biochar have a large negative impact on food security? Research shows it could also have a positive impact although there are still quite some unknown impacts that could work out negatively. In section 6.5.1.20 it reads: "Depending on the scale of implementation, the land requirement for biomass feedstock could be significant and lead to a potentially large adverse side-effect." Therefore, we suggest to use the double arrow. [, Netherlands]	Potential competition for land for food security is the reason for negative impacts on food security shown in revised Fig. SPM3. Context specificity is addressed in section B7 and in section C
30099	15	1	15	1	Why does bioenergy and BECCS have a medium to large negative impact on A, D, L and F? In fact it is the only response option that has a negative impact on A, D and L! There is no evidence that BECCS is always negative, as also correctly highlighted in section 6.5.1.25, where it is clearly stated that these adverse impacts are potentially occurring, not necessarily, since it highly depends on how this option is materialized (for example section 6.5.1.25, lines 18-19 reads " The sign and magnitude of the effects of bioenergy and BECCS, however, depends on the scale of deployment, the type of bioenergy feedstock, and where bioenergy is grown". In other words, negative impacts can be minimized and even be positive. For example, bioenergy plantations on degraded land can reverse desertification. Again we would suggest to use a double arrow, i.e. indicating that the impact can be both positive and negative. [, Netherlands]	Scale dependence of bioenergy and BECCS impacts on several challenges is assessed under section B5
30111	15	1	15	1	Why does Restoration and avoided conversion of peatlands have a negative effect on food security. In section 6.5.1.21 it reads: "...potentially leading to a moderate adverse side-effect for food security globally, ...". We suggest to use the double arrows indicating the impacts can be both positive and/or negative. [, Netherlands]	Potential competition for land for food security is the reason for negative impacts on food security shown in revised Fig. SPM3. Context specificity is addressed in section B7 and in section C
30159	15	1	15	1	Table SPM 1 suggests there are numerous mitigation options that achieve large mitigation potentials. However, figure SPM 6 tells a different story: Most mitigation options have low potentials, except reduction of deforestation and forest degradation, A/R, forest management and, most of all, bioenergy/BECCS. All agricultural reduction options have low mitigation potentials in SPM 6, but moderate to large mitigation potentials in Table SPM 1 [, Netherlands]	Revised Fig SPM3 is based on Chapter 6 assessment and provides thresholds and uncertainties. The first draft Fig. SPM6 was based on a single publication and is not used in the revised SPM
30163	15	1	15	1	In table SPM 1 a large mitigation potential is assigned to 'increased soil organic matter', i.e. more than 3 GtCO ₂ eq per year. However, in table SPM 6 shows a range of 0.7 to 3.5 with a best estimate of about 2 GtCO ₂ eq/yr. So the large arrow upward should be changed into a smaller arrow upwards (=0.3-3 GtCO ₂ eq/yr). [, Netherlands]	Revised Fig SPM3 is based on Chapter 6 assessment and provides thresholds and uncertainties. The first draft Fig. SPM6 was based on a single publication and is not used in the revised SPM
30165	15	1	15	1	In Table SPM 1 agroforestry is 'moderate positive' or 0.3-3 GtCO ₂ eq/yr. Figure SPM 6 shows a range of 0.1-0.55. We would classify this as small positive, so the smallest arrow upwards should be used. [, Netherlands]	Revised Fig SPM3 is based on Chapter 6 assessment and provides thresholds and uncertainties. The first draft Fig. SPM6 was based on a single publication and is not used in the revised SPM
30167	15	1	15	1	Several studies show that reduced deforestation (in Table SPM 1) could be negative for food security. So we suggest to add a double arrow in the F-column (i.e. it is context specific). [, Netherlands]	Revised Fig SPM3 is based on Chapter 6 assessment and provides thresholds and uncertainties. Reduced deforestation and forest degradation has a low confidence associated to the impact on food security

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
30183	15	1	15	1	Table SPM1, panel A): Bio-energy and BECCS are combined, while several impacts only occur for one of the two. Please split into 2 items, which is also justified given their mitigation potential and relevance in current discussion. If you need to save space, rather combine afforestation and reforestation, which show identical impacts and characteristics, except for their costs. [, Netherlands]	Bioenergy and BECCS were kept under the same heading, but are differentiated for some aspects in text
30185	15	1	15	1	Table SPM1, panel A): the order of response options is unclear, and might be improved to get related options close to each other, e.g. afforestation close to reforestation, and restoration of peatland and wetlands next to each other. In principle use same order as in Figure SPM6 . [, Netherlands]	Considered, order was changed
30187	15	1	15	1	Table SPM1, panel A): translation of mitigation potential to the three arrow sizes is unclear, despite the key you provide. Did you use the median estimate green point of figure SRM6 for the mitigation? For options not mentioned in figure SPM6 other impacts the literature source is unclear. [, Netherlands]	Figure SPM 6 is not used in revised draft
30189	15	1	15	1	Table SPM1 (and supporting sections in chapter 6): the size of the impact by response option cannot be verified in many cases: Large co-benefit of EbA on food security cannot be verified. Muang et al. 2015 is given as reference, but not in reference list. Muang et al 2014 is in reference list (but I have no access). Large impact of urban agricultural on food security should be in Chappell et al 2016, but this is only for Brazil .. And large co-benefit for food in response option "improved energy efficiency in agricultura" cannot be verified at all. [, Netherlands]	Supporting sections in Chapter 6 and reference list have been consolidated
33905	15	1	15	1	Table SPM 1 is a very important table. Is it possible to somehow also include ranges in possible mitigation connected to the different response options? [, Norway]	Considered, revised Table SMP3 has been updated
33907	15	1	15	1	Table SPM1: Consider including "conservation/protection of forests" in the summary of co-benefits, side effects etc. in the table, as land management decision is important to many tropical countries with remaining forests [, Norway]	Considered, revised Table SMP3 has been updated
27909	15	1	15	1	The response options could also not be feasible across countries and across systems, and will require certain enabling conditions. [Itchell Guiney, South Africa]	Enabling conditions are assessed under section C
8589	15	1	15	1	Avoidance of conversion of grasslands to croplands is not a mitigation action. It just prevent making things worse. [Marc Aubinet, Belgium]	This response option is addressed since in many regions grasslands are being converted to croplands.
6417	15	1	15	1	Afforestation and reforestation are both included in two separate rows, if this is indeed the intention I suggest to at least locate the rows directly next to each other and also revise whether it is truly correct that reforestation is more costly than afforestation. Most non-annex I countries do not make a distinction between afforestation and reforestation and from their perspective it would make sense to have a single row "afforestation/reforestation". The narrow viewpoint of reducing deforestation to only contribute to mitigation may not give a proper reflection of these efforts. Honduras for example includes REDD+ in its NDC as a means for adaptation, in addition in the land degradation chapter many references are made to deforestation so some contribution to desertification and land degradation also seem appropriate. [Marieke Sandker, Italy]	Figure SPM4 in first draft has been revised and is now integrated together with table SPM1 in revised Fig SPM3, which provides improved consistency. Afforestation and reforestation are now shown as distinct options since most scientific literature separates these issues. Implications of these options across the five land challenges are addressed.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
25261	15	1	15	1	Under improved livestock management the arrow should be bigger for 'Mitigation' (M). As livestock is the one of the major emitter of GHGs. Their feed and shelter management reduce methane emission. [Naresh Kumar Soora, India]	Figure SPM4 in first draft has been revised and is now integrated together with table SPM1 in revised Fig SPM3, which provides improved consistency. Livestock management impacts on mitigation have been assessed based on threshold values and uncertainties estimated
25263	15	1	15	1	Under Ecosystem-based adaptation, why desertification should go up??? Is there any evidence?? It should go down... [Naresh Kumar Soora, India]	Figure SPM4 in first draft has been revised and is now integrated together with table SPM1 in revised Fig SPM3, which provides improved consistency. Ecosystem based adaptation is a framework discussed in Chapter 6 but not part of the revised table for the sake of improving clarity.
31845	15	1	15	1	In this figure, which is missing its figure caption, under A) Restoration and avoid conversion of peatlands, I would suggest that there are cobenefits for both Adaptation and Food security, so there should be small upward pointing arrows in the table here. Restoration of degraded tropical peatlands includes increasing the watertable level and also the surface vegetation cover, and these can decrease surface temperature as well as options for sustainable use of otherwise abandoned, degraded lands. Adaptation to a warmer climate thus benefits, as does food security where water-tolerant food crops can be grown on hydrologically restored tropical peatlands that are currently abandoned. [Samantha Grover, Australia]	Considered, revised Table SMP3 has been updated
4909	15	17	15	38	Suggest specifying "long-term" or "short-term" because "long" could mean different duration depending on the scientific field one is working on" [, Japan]	Considered, revised Table SMP3 has been updated and diagrams simplified
23033	15		15		Figure A) is not readable, compare to the following Figures (B,C). [Anastasios Kentarchos, Belgium]	Considered, revised Table SMP3 has been updated and diagrams simplified.
30833	15		15		this table should include restoring natural hydrology to restore wetlands including peatlands to promote carbon storage and slow flows of rivers to reduce flood and drought impacts [Mike Morecroft, United Kingdom (of Great Britain and Northern Ireland)]	Integrated water management is a response options included in revised Fig SPM 3

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
17397	15		15		The impact of Reforestation and Afforestation to combat land degradation depends very much on the how and the definition of 'land degradation' itself. As mentioned in the comments on the definition of land degradation in chapter 4, land degradation should include the impact on biodiversity and more broadly speaking the impact on ecosystem services as part of the ecological integrity that is challenged by degradation drivers. This representation in SPM on p15 (Figure A) gives the impression that all reforestation, and especially afforestation measures, counteract land degradation. If it is done under the definition of land degradation in Chapter 4 to increase productivity as key indicator, this might be right. However, ecological integrity through biodiverse and healthy ecosystems make land resilient to future degradation and secure and foster their ecosystem services for people and biodiversity, this report should define good and bad reforestation and afforestation more clearly. Replanting lost or degraded forest or planting new forests with monoculture bioenergy crops might deliver a certain 'productivity' but real resilience to land degradation is achieved, if restoration or planting measures support the ecological integrity of these reforestation and afforestation areas through the use of a diverse mix of native species most resilient to expected biome shifts and other climate impacts. Like it is outlined on page 52 in chapter 4, "the more biodiverse ecosystems are, the lower the impact of extreme events on those systems and therefore the less vulnerable systems are to climate driven degradation (resilience)". This report should make a clear differentiation between these different approaches as most afforestation schemes seen in practice are monoculture tree plantations with a diversity of negative impacts. [Taehyun Park, Republic of Korea]	Considered, revised Table SMP3 has been updated and diagrams simplified. Impacts on ecosystem services are assessed in Chapter 6 sections referred to by SPM sections B and C
17399	15		15		Table SPM1 A) of co-benefits and adverse side effects of land management response options doesn't contain key categories like biodiversity or resilience of the sequestered carbon. It lists "afforestation" as beneficial for adaptation. This is true for "reforestation" which has adaptation, biodiversity and other benefits. Afforestation with monoculture plantations by contrast often creates more adverse impacts on adaptation, biodiversity and sequesters carbon in a less resilient way. Forest management is listed in the table without adaptation benefits, even though natural forest management with reduced logging rates and impacts can create significant adaptation benefits together with biodiversity and other benefits on top of its significant mitigation potential. [Taehyun Park, Republic of Korea]	Considered, revised Table SMP3 has been updated and diagrams simplified. Impacts on ecosystem services are assessed in Chapter 6 sections referred to by SPM sections B and C
17401	15		15		Reforestation and afforestation are linked to 'saturation' as an issue. It should not. Re- or afforested areas will sequester carbon at high rates vor 100+ years. That is, for the period crucial to mitigate climate change, saturation will not be an issue here. [Taehyun Park, Republic of Korea]	Considered, revised Table SMP3 has been updated and diagrams simplified. Saturation issue is not presented in the revised table
4399	15	0	16	0	The use of images in the tables is not very clean or clear. Simplifying the diagrams would make interpretation of tables easier. It would also be helpdul to move key table on page 16 to before table A) [, New Zealand]	Figure SPM4 in first draft has been revised and is now integrated together with table SPM1 in revised Fig SPM3, which provides improved consistency. Diagrams were simplified
28297	15	1	16	1	These graphs, which come from Chapter 6, are trying to do a lot -- maybe they should be limited to two levels of impacts instead of three? The results should be checked before the SPM negotiations. For example, is it really the case that 4.2 billion people - more than half the world's population - could be negatively affected by biochar? [Barron Joseph Orr, Germany]	Considered, revised Table SMP3 has been updated and diagrams simplified

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
3325	15	1	16	1	These tables are hard work - I realise the authors are tryign to represent a lot of information in one place but suggest they are actually trying to do too much here. One option could be to use each category in the table (e.g. dietary change) have that bit of the table folloiwed by the associated text. This would make for a large number of small, focussed tables for each category, rather than this huge one. Definitely a job here fo a graphics/comms expert to improve these as they provide key information but currently don't really work in my view. [Dave Reay, United Kingdom (of Great Britain and Northern Ireland)]	Considered, revised Table SMP3 has been updated
33995	15	1	16	1	Table SPM1 does not support the notion that response options need to be combined to achieve maximum benefit and to avoid adverse side-effects. In the current set-up it invites to just pick the options with most co-benefits and no/or small trade-offs. However, literature shows that largest benefit can be achieved when options that decrease the pressure on land are combined with options that increase pressure on land (e.g. yield increase and diet change combined with biomass cropping). see remarks in chapter 6. THis problem can be solved by - exemplarily - showing an additional panel with a option package and the combined impact on the challenges. [Elke Stehfest, Netherlands]	Revised Fig. SPM4 provides illustrative pathways based on combinations of response options
15317	15	1	16	1	Suggest update Table SPM 1 with more useful categories (see previous comment and suggestion 'supply' and 'demand' are offered as alternatives) and simplify the content to retain only the most informative elements. For example, almost all the items have educational and institutional aspects so may not be part of the key message here. [, Australia]	Considered, revised Table SMP3 has been updated and diagrams simplified
24429	15	1	16	1	Table SPM.1. It is an interesting figure, but the degree of evidence and agreement should be clarified. To keep it in the report, it needs to have sufficient level of confidence for all indicators. The uncertainty must be explained in a clear way, and the authors must be able to ensure that it is comprehensive (i.e. that no important responses are missing). [, Belgium]	Considered, revised Table SMP3 has been updated and diagrams simplified
21857	15	1	16	1	In the SPM Fig. on pp. 15-16 (Table SPM 1), a lack of arrow for the M/A/D/L/F-options leaves it unclear, whether there is no data available to assess the impact, or if there is no impact based on literature. For example, apparently there is no data available to assess the interlinkage of forest management and adaptation (based on section 6, which is contrary to Fig. SPM 1). This distinction could possibly be made explicit by adding one or two further symbols. On a general level, this figure/table contains very much information and it is rather challenging to digest it. Please, identify the key messages and simplify the figure. [, Finland]	Considered, revised Table SMP3 has been updated and diagrams simplified

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
25943	15	1	16	1	We believe that this figure is relevant and justified, and we suggest to improve it by adding two columns for biodiversity and water to also assess the impacts of each option on them (for example, using three elements: -, 0, +). We also suggest the following considerations: <ul style="list-style-type: none"> Increasing soil organic matter content or reducing losses of organic matter from soils will also largely contribute to adaptation of agriculture to climate change (e.g. reducing erosion, increasing water storage/content in soils...). The arrow "Adaptation" for "Increased soil organic matter" should be larger. "Behavioural barriers" item should be added to "Improved cropland management". Improved grazing land management seems to cover also natural ecosystems. "Natural systems" item should be added to the column "Sectors" Bioenergy and BECCS should be presented as costly options (SR15). Three coins should be added in the column "Costs". Sustainable forest management contribute to adapt forests to climate change and involve natural systems. A large positive arrow should added in the cell "Adaptation", and the "natural systems" item should be added in the column "Sectors." Biochar has a high mitigation potential locally but as it requires a lot of biomass to be processed (and thus produced) this means that the global potential is to be reduced. The arrow show be less large. This will also be consistent with the following sections of the report: lines 25-30 page 1-33, Table ES 2.1 page 2-6, lines 31-42 page 4-86. See GENERAL COMMENT ON BIOCHAR. We suggest to add, below biochar, a line about organic waste recycling (e.g. manure, composts) that is mentioned in chapter 2 and 4. Recycling of organic waste is able to improve soil fertility and soil organic matter and to generate strong cobenefits in mitigation, adaptation, land degradation and food security. Large positive arrows should be added to the columns of these challenges. Some emphasis is put in the SPM on insurances. If they can be very useful, we would like the SPM to explicit that as a priority, prevention actions need has to be taken, and in parallel of them, to face residual risks, it's important to have a global strategy that can mix, depending from the local situation and choices, some private risk management (like precautionary savings, agricultural mutual funds, insurance) and direct public intervention, depending on the risk/loss intensity. Concerning their costs, further explanations should be provided, including the relevant stakeholders. Could you confirm that the idea is if insurances are provided by private companies then this will cost less for States? Agricultural practices behind improved xxx or management of xxx should be detailed, for instance in the §B5.2. Why isn't it sustainable instead of improved? See GENERAL COMMENT ON DETAIL OF THE PRACTICES solutions exists, some of them are quite easy to apply, some have negative cost, but it's sometimes not enough for them to be applied. This is a main issue. 	Considered, revised Table SMP3 has been updated and diagrams simplified
17583	15	1	16	1	It is not clear what the material on pages 15-16 is. A figure? [, Sweden]	Considered, revised Table SMP3 has been updated and diagrams simplified
20811	15	1	16	1	Overall, this figure is helpful, the caption should also explain key aspects of it, such as the boundaries between low/medium and high costs and what is meant by saturation issues, [, United Kingdom (of Great Britain and Northern Ireland)]	Considered, revised Table SMP3 has been updated and diagrams simplified
8799	15	1	16	1	Reviewing these figures needs to mobilize a very broad scientific expertise...no so easy to do in depth. That said, the different levels of large impact, medium impact, low impact (+ or -) might be subject to controversy. I would suggest to consider limiting this to two categories High and low (positive or negative). It is not clear why for some options their impacts on D and L and not of the same extent (e.g agricultural diversification, ecosystem based adaption, reduce food waste, establishing secure land tenure, prevent land grabbing). [Jean-Luc Chotte, France]	Considered, revised Table SMP3 has been updated and diagrams simplified

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
29747	15	1	16	1	Overall I found these tables of the SPM to be extremely useful. I think they contain the right amount of the right kind of information to be helpful to policy-makers and development practitioners. I would urge you to look again at some of the wording though. Is 'Impacts on land challenges' the correct phrase? I am not sure it completely makes sense. I interpret your meaning of 'Impacts on land challenges' as being: 'Effectiveness of specific measures/interventions [in addressing mitigation, adaptation, food security potential, and the challenges of degradation and desertification].' Is that what you meant and could you rephrase it as such? [Mairi Dupar, United Kingdom (of Great Britain and Northern Ireland)]	Considered, revised Table SMP3 has been updated and diagrams simplified
14503	15	1	16	1	What is the number of this 2 pages chart? (Figure? Table? or,,?) [Shuzo Nishioka, Japan]	Considered, revised Table SMP3 has been updated and diagrams simplified
14505	15	1	16	1	This chart is very informative. Almost all options have cobenefits but Food security. Some of the icons used are difficult to understand the meaning of shape.. [Shuzo Nishioka, Japan]	Considered, revised Table SMP3 has been updated and diagrams simplified
32387	15	1	16	2	There are quite a number of assumptions in Table SPM 1 that can be disputed, also in light of the findings in, especially, Chapter 2, and some positive effects are not recognized. Increased food productivity could trigger either positive or negative impacts on land degradation, food security and even climate change mitigation and adaptation, if intensification technologies are associated with adverse ecological impacts. Sustainable forest management has co-benefits for adaptation and in some cases even for food security. Reduced deforestation has positive co-benefits for adaptation, desertification, land degradation and in some cases even food security (see HLPE, 2016). Reforestation and afforestation could have co-benefits or adverse impacts on climate change mitigation and adaptation, land degradation, desertification and food security, depending on the species and methodology used and, in case of afforestation, the direct and indirect land use change. The positive impact of biochar, bioenergy and BECCS on climate change mitigation is disputed. Dietary change and reducing food waste can contribute to adaptation too, especially if food production levels decline. [Simone Lovera-Bilderbeek, Paraguay]	Considered, revised Table SMP3 has been updated and diagrams simplified
32501	15	1	16	2	HLPE. 2016. Sustainable agricultural development for food security and nutrition: what roles for livestock? A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome. [Simone Lovera-Bilderbeek, Paraguay]	Considered, revised Table SMP3 has been updated and diagrams simplified
803	15	1	16		need to clarify that D means REDUCTION of desertification, L means REDUCTION of land degradation and F means IMPROVEMENT of food security (in line 1, at the end of page 15). The same letters should be used in the three sections of the table. As mentioned before, we don't agree with the classification of land related mitigation and adaptation options, therefore, we would like to see sections A) B) and C) all together in one single section of the figure. [, Spain]	Considered, revised Table SMP3 has been updated
33909	15		16		Table SPM 1: The association of response options with the sectors is not clear. E.g. improving grazing land management could be classified both in the agricultural or in natural system sector? Please consider to be more transparent with the criteria for this selection, either in the SPM or at least in the associated table in the chapter. [, Norway]	Considered, revised Table SMP3 has been updated and diagrams simplified.
6861	15		16		Very effective synoptic table. But the consequences of it - that we have to differentiate between measures that have predominantly co-benefits (such as increases of SOM etc) and those that have many negative side effects, such as biofuels, are not effectively communicated in the text of the SPM. [Markus Giger, Switzerland]	Considered, revised Table SMP3 has been updated and diagrams simplified.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
27799	15		16		There is no title for the pictures. Please add a title and description. [Raehyun Kim, Republic of Korea]	Considered, revised Table SMP3 has been updated and diagrams simplified.
4249	15		16		Not easy to comprehend. Everyline has an "educational" symbol so better to simplify by deleting and just stating in the related text "Educational barriers are common to every response option". Costs fairly vague - what does "high cost" actually mean for example - and a cost to who? How were these costs determined and by whom? Better to put M A D L F in full at top - use words on an angle to fit. The footnote table could be greatly simplified to reduce all the wording. E.g. directly under "Mitigation" put "GtCO2e/yr" then rest of column would simply be >3; 0.3-3; 0.1-0.3 (NOT ">0"!); 0; -0.1-0.3'; -0.3-3; >-3. Same for all other columns e.g. using "Million people" and "Mha" under column headings.It is all tricky to figure out how many of the "response options to value-chain management" (better to say "food value-chain") as quoted "address land challenges" as the title suggests. Also energy efficiency cuts across the whole agri-food system (eg see Energy Smart Food for People and Climate 2011, FAO http://www.fao.org/docrep/014/i2454e/i2454e00.pdf) [Ralph Sims, New Zealand]	Considered, revised Table SMP3 has been updated and diagrams simplified.
40399	15		16		This figure should be traceable to the assessed literature (exact references supporting each pictogram) and lacks information on level of confidence (beyond potential scale of impact). [Valerie Masson-Delmotte, France]	Considered, revised Table SMP3 has been updated and diagrams simplified.
13123	15	0	17	14	Table SPM 1. I think this table is too complex for the spm. Perhaps collapse some of the response options into fewer. Also some icons are too complex to easily pick out. [David Cooper, Canada]	Figure SPM4 in first draft has been revised and is now integrated together with table SPM1 in revised Fig SPM3, which provides improved consistency. Diagrams were simplified
13125	15	0	17	14	Table SPM 1. I would challenge some of the assessments of benefits/adverse effects under MADLF in Table (A). Reduced deforestation, management of invasive species, restoration of wetlands and peatlands, will each have co-benefits for A, and L, some for D. More detailed comments under Chapter 6. [David Cooper, Canada]	Figure SPM4 in first draft has been revised and is now integrated together with table SPM1 in revised Fig SPM3, which provides improved consistency. Diagrams were simplified
33093	15	1	17	2	Table SPM.1 seems too complex and long for an SPM. Each of its detail should be well-checked in order to avoid misinterpretations. [Philippe Marbaix, Belgium]	Considered, revised Table SMP3 has been updated and diagrams simplified
7727	15	1	17	3	The expression of A), B) and C) of Table SPM1 is inconsistent. For example, size of the symbols in A) is bigger than other two tables. Abbreviation is used for M, A, D, L and F in A), but full words are used in other two tables. [Hiroaki Kondo, Japan]	Considered, revised Table SMP3 has been updated and diagrams simplified
4903	15	1	17	12	In Table SPM.1 A), B) and C), we would suggest clearly mentioning that the white areas mean not only no/negligible impacts but also no global estimates of impacts in light of section 6.4 and 6.5. [Japan]	Considered, revised Table SMP3 has been updated and diagrams simplified
4905	15	1	17	12	In Table SPM.1 A), we suggest that the following icons be added based on section 6.5.1: - reversibility issues of "Reduced deforestation" - technological barriers for "Biochar" [Japan]	Considered, revised Table SMP3 has been updated and diagrams simplified
4907	15	1	17	12	In Table SPM.1 B), we suggest that the following icons be added based on section 6.5.2: - biophysical and technological barriers for "Dietary change" [Japan]	Considered, revised Table SMP3 has been updated and diagrams simplified

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
38329	15	1	17	12	The column labeled "Impacts on land challenges -- co-benefits and adverse side effects" is a little confusing. When there is an arrow pointing up for Desertification, is that a co-benefit or an adverse side effect (the answer is fairly clear, but it is hard to parse in less than a minute or two)? It seems like since Adaptation, Mitigation, and Food Security are good; up arrows should be good. For Desertification and Land Degradation, are up arrows increases (increased adverse side effects) or improvements (co-benefits)? To clarify, since all up arrows are improvements, remove the "adverse side effects" language in the header (but leave the description in the legend). Would it make sense to change Desertification to "Reduced Desertification" and Land Degradation to "Reduced Land Degradation"? [, United States of America]	Considered, revised Table SMP3 has been updated and diagrams simplified
38331	15	1	17	12	A lot of thought and effort undoubtedly went into this infographic/chart, but it is surprisingly difficult to read (seems like too much information for one chart). The goal is to provide a single summary reference figure, which is admirable. Major alterations are needed to realize this goal. The symbols are meant to be simple, but some are still difficult to recognize and parse (the Saturation/Reversibility cup and faucet/lock, the Natural Systems landscape, and the Technological computer [or train?]) in particular are difficult to see/understand. Try to simplify these symbols further (all symbols other than the arrows, maybe). Additionally, what are "Educational" barriers? Are they a lack of knowledge (so more of a research/human understanding barrier) or is it difficult to teach people about, say "Stability of Food Supply"? Every single response has an Education barrier, which makes it seem irrelevant to include on the chart. Just say in the caption that education about these issues is a persistent barrier to implementation. [, United States of America]	Considered, revised Table SMP3 has been updated and diagrams simplified
38333	15	1	17	12	The title needs to be *before* the table and not on page 3. [, United States of America]	Considered, revised Table SMP3 has been updated and diagrams simplified

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
27637	15	1	17	14	<p>We would appreciate a summarizing presentation of the various response options considered in this report possibly as a table with icons, but rather as an annex and with much reduced complexity. We have some serious concerns with the current presentation and strongly encourage the authors to improve the table before including it in the SPM:</p> <p>1) This is an extremely complex figure (or table, if we read the caption correctly) that conveys absolute judgments without any notion of uncertainty. To make the robustness of the individual assessments clearer, it would be helpful to introduce the notion of confidence, e.g. by shading or outlining the arrows. There is currently no reason why the arrow indicating "small medium and large" has to change shading as well as size; so if size was to depict size of effect, shading could represent confidence without adding more visual complexity.</p> <p>2) You may also consider to remove the icons for saturation and reversibility and to replace that column with a simple symbol depicting "yes/no" - as the icons don't convey any information that is not yet contained in the header. A similar simplification could be applied for the four columns on barriers. The intensity of the colour of the yes/no symbols could then express the level of confidence in the assessment.</p> <p>3) Most of these options are directly responding to the threat of climate change. Hence their consequences for MADLF are not secondary but their primary objective. Therefore, "co-benefits and adverse side-effects" in the titles should be replaced by "positive/negative consequences" or a similar wording.</p> <p>4) How have the items mentioned in this table been chosen? For example, Table B on value chain management has a strong focus on food and lacks information on other sectors. Please improve the caption on page 17, lines 6-13 and explain the approach to this table, including how "targets" and "baseline" have been defined, and the role of expert judgement.</p> <p>5) On the sectors: Does Agriculture not overlap with Food systems?</p> <p>6) Please consider to exchange columns and rows in the table on page 17. This would facilitate the understanding of its purpose, i.e., to define the "sizes of impacts" (which should be symmetric). In addition, please do not use the word "impacts" in this context, because the IPCC usually refers to the impacts of climate change (as defined in the glossary), not the consequences/effects of response measure to its threats.</p> <p>7) We suppose the technological barriers of "BECCS" are much higher than for "reduced deforestation", however in the table this is not reflected at all. This is the case for many more issues. Therefore, we urge the authors to present the barriers in a more quantified way to reflect for such crucial differences within the barriers. Otherwise it will be very hard to extract</p>	Considered, revised Table SMP3 has been updated and diagrams simplified
24675	15	1	17	14	<p>These figures are complex and obscure and could be simplified to focus on key issues. A number of them are repeated. [Ireland]</p>	Considered, revised Table SMP3 has been updated and diagrams simplified
30395	15	1	17	14	<p>Table SPM 1 is quite unclear and undistinct. The impact of a measure is hard to predict at a general level. It depends a lot on how a measure is being implemented. In stead of speculating about impacts in general, the advice should be to make a land evaluation/impact assessment with long term scenario's when planning large scale adaptive measures. Recently, under the CBD a protocol has been established for this kind of operations. [Netherlands]</p>	Considered, revised Table SMP3 has been updated and diagrams simplified
17585	15	1	17	14	<p>The meaning of "Saturation" and "Reversibility" are not readily obvious, and should explained. There may also be a need to differentiate between cases how imminent issues these are, or suchlike. [Sweden]</p>	Figure SPM4 in first draft has been revised and is now integrated together with table SPM1 in revised Fig SPM3, which provides improved consistency. For the sake of clarity, the concepts of saturation and reversibility have been omitted from this SPM figure but are discussed in corresponding sections of Chapter 6.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
29929	15		17		Blank/no arrows mean no or negible impact. Are all this impacts really so well known? Is it possible that we just don't know the impact? The option of not knowing or no evidence need to be available as well. In terms of costs - do low costs also cover positive costs/economic gains and benefits (these are mentioned later in the report) from these measures. And what are these costs? Or what are they relative to? [, Estonia]	Considered, revised Table SMP3 has been updated and diagrams simplified.
11647	15		17		excellent summary and thumps-up for including the cultural component in line with the definition of sustainability [Linah Ababneh, Sweden]	Considered, revised Table SMP3 has been updated and diagrams simplified.
13445	15		17		Messages are not clear because some legends are missing. [Lourdes Tibig, Philippines]	Considered, revised Table SMP3 has been updated and diagrams simplified.
17353	15		17		The Summary Table of co-benefits and Table SPM1, adverse side effects, etc in the part "Impacts on land challenges - co-benefits and adverse side effects" is a bit ambiguous to interpret. For instance the first Response option- Increasing soil organic matter - when reading the table one sees that all challenges evaluated (Mitigation, Adaptation, Desertification, Land Degradation and Food Security) have an impact with co-benefit. However this looks like that there is a "beneficial effect" on desertification and land degradation which in fact it is the opposite (increased SOM will ameliorate the land and decrease desertification impact). One suggestion could be to replace Land degradation to Land improvement and Desertification to No Desertification (ND). This way the table would be more straight forward to read and interpret. [Maria Helena Cruz de Carvalho, France]	Considered, revised Table SMP3 has been updated and diagrams simplified.
17831	15		17		The key for M, A, D, L, & F should be at the top of the chart so that the reader already knows what they are looking at without having to scroll down 2 pages- [Quentin Lejeune, Germany]	Considered, revised Table SMP3 has been updated and diagrams simplified.
16455	15	1			The symbol of agricultural sector would be better to change due to hard to recognition easily, as possible. [, Republic of Korea]	Considered, revised Table SMP3 has been updated and diagrams simplified
16457	15	1			Can't find labels discribed Table or Figure. [, Republic of Korea]	Considered, revised Table SMP3 has been updated and diagrams simplified
15895	15				Fig, line "sustainable forest management": no info on impacts on adaptation and desertification? This is rather surprising. [Caroline Vincke, Belgium]	Considered, revised Table SMP3 has been updated and diagrams simplified.
15215	15				The chart is coded in a confusing way insofar as upward arrows generally mean an increase in a parameter, but herein they seem to indicate a decrease in 2 of the 5 parameters (i.e. Desertification and Land Degradation) [Daniel Zarin, United States of America]	Considered, revised Table SMP3 has been updated and diagrams simplified.
29641	15				This figure is quite difficult to read, although it does contain a lot of useful information. Improving the clarity of some aspects would be helpful, e.g. some of the symbols are not easy to read. It is also difficult to understand how some of the classifications were made - e.g. why is biochar so bad for food security when it could also have yield benefits? And what scales of response options are being considered? Many options will have different impacts depending on the scale. [, Saint Lucia]	Considered, revised Table SMP3 has been updated and diagrams simplified.
20813	15				Not clear what the distinction is between desertification and land degradation in the diagram. Please clarify. [, United Kingdom (of Great Britain and Northern Ireland)]	Considered, revised Table SMP3 has been updated and diagrams simplified.
5319	15				table SPM 1, Part A: bioenergy and BECCS: it is strongly suggested to include that reversibility is an issue because BECCS depends on the ability of forests/bioenergy to regrow - and the corresponding response options in forestry and agriculture also have this qualification of reversibility. Similar for reduced deforestation: there seems also to be an issue with reversibility - similar as for other response options related to forestry. [Klaus Radunsky, Austria]	Considered, revised Table SMP3 has been updated and diagrams simplified.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
17807	15				This figure contains a lot of information, which is useful in some ways but it also takes a while for the reader to be able to understand what is covered. It is also not clear what scale is being considered - e.g. some of the negative impacts on food security would arise from large-scale interventions, so does this mean that the table considers options deployed at large scale? I'm surprised there are not more variable arrows, in particular in the food security column. For institutional barriers, surely in most cases these are context specific? [Quentin Lejeune, Germany]	Considered, revised Table SMP3 has been updated and diagrams simplified.
27801	15				[sustainable forest management] Generally, SFM give positive impact on adaptation, desertification and food security. [reduced deforestation] Generally, reduced deforestation give positive impact on Adaptation, Desertification, Land Degradation and Food Security. [reforestation and afforestation] reforestation do not effect largely on food security because all of the afforestation and reforestation do not occurred only cropland. [restoration and avoid conversion of peatlands] This response give strong positive impact on mitigation, adaptation and land degradation [Raehyun Kim, Republic of Korea]	Considered, revised Table SMP3 has been updated and diagrams simplified.
26085	15				The arrow under A in the first line should be larger (for adaptation benefit of increased soil organic matter) [Reid Detton, United States of America]	Considered, revised Table SMP3 has been updated and diagrams simplified.
12529	16	0	16	0	In Section C) of infographic Summary of Co-Benefits. Why such a small upward arrow or mitigation contribution from secure land Tenure? This is not just an adaptation option. There are huge areas of collective and customary forest land with high leaf index area and of high carbon stock value managed by Indigenous peoples which, if their Tenure were secure, would continue to be a high mitigation solution. See WRI report.2014. Combating Climate, Securing Tenure and the reduced Deforestation emissions calculations based on Matt Hansen Maryland data [Davies Penny, United States of America]	Considered, revised Table SMP3 has been updated and diagrams simplified. Land tenure is further discussed under section C
14575	16	0	16	0	Table C. The genetic component should be broader than promotion of seed sovereignty. Livelihood diversification requires a definition. There needs to be direction or a clear link to text that defines the response options. [., Canada]	Considered, revised Table SMP3 has been updated and diagrams simplified.
12589	16	1	16	1	Challenge to the 3 coin rating of cost of post-harvest loss reduction. As detailed for the body of the report, some of these losses occur as a result of unfair trading practices (the Resource-Efficiency of the Food Supply Chain'. Luxembourg: European Court of Auditors. 2016) and therefore require market re-adjustment rather than technological solutions. These are not necessarily costly, and, on the contrary, can improve security of livelihoods in producing countries. [Carina Millstone, United Kingdom (of Great Britain and Northern Ireland)]	Considered, revised Table SMP3 has been updated and diagrams simplified.
12593	16	1	16	1	I applaud the inclusion of 'Prevention of land grabbing' and the 'Promotion of Seed Sovereignty' in the SPM, but these points are not sufficiently expanded on in the body of the report. In particular, the risks of land grabbing associated with CDRs technologies are glossed over in the report. The intersection between food sovereignty and food security is not sufficiently developed. [Carina Millstone, United Kingdom (of Great Britain and Northern Ireland)]	Considered, revised Table SMP3 has been updated and diagrams simplified. Land tenure is further discussed under section C
27641	16	1	16	1	Summary of co-benefits, table B): Please specify "dietary change", this could mean anything, but you probably refer to a directed change towards e.g. less animal products? [., Germany]	Considered, revised Table SMP3 has been updated and diagrams simplified.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
27643	16	1	16	1	Summary of co-benefits, table B): Food transport and distribution is a key area of adaptation, check this gap in your table, also in the underlying chapter please. [, Germany]	Considered, revised Table SMP3 has been updated and diagrams simplified.
27645	16	1	16	1	Summary of co-benefits, table B): Please better specify "urban food systems": urban agriculture? Which kind of change / improvement do you refer to? [, Germany]	Considered, revised Table SMP3 has been updated and diagrams simplified.
23785	16	1	16	1	Dietary changes are also part of adaptation....it should be an up arrow.... [, India]	Considered, revised Table SMP3 has been updated and diagrams simplified.
25265	16	1	16	1	Ditery changes are also part of adaptation....it should be an up arrow.... [Naresh Kumar Soora, India]	Considered, revised Table SMP3 has been updated and diagrams simplified.
31847	16	1	16	1	under B) Urban food systems, I would suggest that there are cobenefits for Mitigation and Adaptation. These arise from increased CO2 uptake from vegetation in urban areas, and the cooling effect of vegetation in urban areas. Two small upwards arrows should be added under M and A. [Samantha Grover, Australia]	Considered, revised Table SMP3 has been updated and diagrams simplified.
23787	16	2	16	2	Reduced food wastage is also a part of adaptation step [, India]	Considered, revised Table SMP3 has been updated and diagrams simplified.
25267	16	2	16	2	Reduced food wastage is also a part of adaptation step [Naresh Kumar Soora, India]	Considered, revised Table SMP3 has been updated and diagrams simplified.
23035	16		16		Within the Table SPM1, summary B), in row - dietary change - is missing an arrow for Adaptation. As it is said further in the text (See paragraph B5, p 21): All components of the food system (i.e., production, transport, packaging, processing, storage, food choice and consumption, loss and waste) can contribute to climate change mitigation and adaptation. [Anastasios Kentarchos, Belgium]	Considered, revised Table SMP3 has been updated and diagrams simplified.
7729	16		16		The symbols used in Table SPM 1 are not always comprehensive. (see the comment No.140 for Chapter 6, below) [Hiroaki Kondo, Japan]	Considered, revised Table SMP3 has been updated and diagrams simplified.
7659	16		16		Summary Figure B identifies land tenure as an adaptation in the sense that securing it somehow is an adaptation? IN some circumstances like coastal ones exposed to sea level rise that may not be a suitable adaptation so it is unclear why this is listed. Again more inclusive risk based options are needed. The risk management part of this summary is patchy and underdone. [Judy Lawrence, New Zealand]	Considered, revised Table SMP3 has been updated and diagrams simplified. Land tenure is further discussed under section C
23789	16	1	17	1	Consider revising the arrows carefully. The cost of enhancing resource use efficiency in agriculture can be very high due tte numbers involves similiary please revisit each and every cell for correctness. [, India]	Considered, revised Table SMP3 has been updated and diagrams simplified.
25269	16	1	17	1	Consider revising the arrows carefully. The cost of enhancing resource use efficiency in agriculture can be very high due tte numbers involves similiary please revisit each and every cell for correctness. [Naresh Kumar Soora, India]	Considered, revised Table SMP3 has been updated and diagrams simplified.
27647	16	1			Summary of co-benefits, table B): Would it be possible to provide information on cropland agriculture and livestock separately? [, Germany]	Considered, revised Table SMP3 has been updated and diagrams simplified.
3843	16	1			At the top of the list in part (B) of this chart, insert a line for the option "reduce population pressure". The most adequate sector might be "agriculture". Thick, positive arrows should probably represent impacts for all five land challenges Considered. Indicated barriers might be educational and cultural/behavioural. No indication for the cost is suggested. Note the cost might be significant: for example, since in some countries parents feel the need to have many children in order to be taken care of in their old age, it may appear judicious to create and finance retirement pensions. [Philippe Waldteufel, France]	Considered, revised Table SMP3 has been updated and diagrams simplified.

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32909	16				In box C, two changes. Delete "for disaster risk reduction" after early warning systems. There are several different types of relevant early warning systems, only one of which is usually associated with DRR. There are early warning systems for extreme climatological events such as cyclones and hurricanes -- these are DRR sort of EWS. There are early warning systems for drought. And there are early warning systems for harvests and food insecurity -- for example FEWS, the famine early warning system, which seems particularly appropriate to highlight in this report and which I don't think is yet included. The second change is to eliminate "commercial" from in front of crop insurance. Crop insurance may not always be solely a private-sector initiative. [Doreen Stabinsky, United States of America]	Considered, revised Table SMP3 has been updated and diagrams simplified.
23759	16				Response options such as prevention of land grabbing and promotion of seed sovereignty. How practical or realistic are these to implement. [, India]	Considered, revised Table SMP3 has been updated and diagrams simplified. Land tenure is further discussed under section C
23261	16				There is a lot of information in this Table. But important to note in the context of the previous comment that almost all of the 'Risk management' options are institutional in nature (except perhaps for the 'Early warning system one' -- which arguably is too). So perhaps just change the name from 'Risk management' to 'Institutional' as almost all of the preceding examples in the table under the 'Land management' and 'Value chain' headings could be classified as being risk management. [Mark Howden, Australia]	Considered, revised Table SMP3 has been updated and diagrams simplified.
3029	17	6	16	6	'technical' : what it means here? [, Russian Federation]	Noted. This represents the biophysical potential which is defined differently in the literature assessed. Technical potential was used in IPCC AR5. See IPCC AR5 for definition
25947	17	1	17	1	It seems surprising in Table SPM 1 that "Increased energy efficiency in agriculture" induces a larger benefit for adaptation than for mitigation. Same remark for "Improved efficiency and sustainability of food processing ..." [, France]	Noted. The thresholds for mitigation effectiveness are quite large. The magnitude of the global impact is assessed relative to the thresholds - so the colour of "magnitude" effects are judged relative to these thresholds, not relative to each other for each land challenge. This has been addressed by improving the key.
25949	17	1	17	1	1) This table is very interesting but should be later in the SPM (in section C), as assessing the effect on the multiple challenges of the different solutions provided by the report. 2) The solutions provided should be explained in order to be useful for policy makers, what are the practices behind "improved xx", "management of xxx", there are always several very different ways to understand it, with very different effects on the different challenges. Please explain a bit by giving examples, and for each, clearly refer to a specific § of the report. [, France]	Noted. The updated table (now SPM3) is located in section B which focuses on response options is required to introduce many of the options which are discussed in the text. The order of response options has been improved by grouping them by category. While it is not possible to list full explanations of each response option in the figure (due to space limitations) references are given in the technical caption (updated) for tables and sections in Ch6 which provide more detail.
6803	17	1	17	3	In the tables on pages 15 to 16, A, B, and C only refer to {6.5.1}, and the whole report also includes {6.5.2} and {6.5.3}, which is not consistent with the whole report. [Changke Wang, China]	Accepted. The technical caption has been updated and line-of sight to specific sections clarified.
2147	17	1	17	3	Should distinguish secure individual land tenure from secure Indigenous and/or collective land tenure. Research on the former suggests the effects on reforestation are large but on deforestation are uncertain. Research on the latter suggest the effects on deforestation are large and on reforestation uncertain. Collective tenure security is often also associated with different types of protected area status. These conclusions are solid and empirically relevant enough to merit specific mention in this summary. [David Kaimowitz, Nicaragua]	Noted. Securing land tenure has been removed from this table as it is a policy response rather than a response option. It is now covered in Chapter 7.

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2149	17	1	17	3	Peer-reviewed literature demonstrating the climate mitigation affects of secure collective tenure includes: A Blackman and P. Veit 2018, Ecological Economics. A. Blackman 2017 PNAS. J. Busch and K. Ferreti Gallon 2107. Review of Environmental Economics & Policy. M.G. Ceddia, U. Gunter, and A. Corriveau-Bourque. 2015 Global Envir. Change. A. Blackmen. Ecological Economics 2015. A.A. Min-Venditti, G.W. Moore, and F. Fleischman 2017 Global Environmental Change. [David Kaimowitz, Nicaragua]	Noted. Securing land tenure has been removed from this table as it is a policy response rather than a response option. It is now covered in Chapter 7.
2151	17	1	17	3	The peer-reviewed literature suggests that secure collective land tenure would have a much larger mitigation impact than is shown here. [David Kaimowitz, Nicaragua]	Noted. Securing land tenure has been removed from this table as it is a policy response rather than a response option. It is now covered in Chapter 7.
25945	17	1	17	3	The order of the responses is not obvious. Why afforestation and reforestation do not appear in consecutive lines? [, France]	Noted. The ordering of the response options has been revised and they are now grouped by category.
8853	17	1	17	6	criteria used is global and does not lend to regional and nationl application. It will be useful as a policy tool in the context of sPM to define criteria that could be applicable at the regional and national levels, and perhaps local levels [Jean-Luc Chotte, France]	Noted. The data shown in this table are global and it was not possible to show regional implications of response options. However, further information on each of the response options is shown in Ch6 (specific references to chapter tables and sections in the updated technical caption) as well as their interaction with UN SDG's.
14577	17	1	17	12	Table SPM.1. Please clarify the purpose of this table. [, Canada]	Noted. Table SPM1 has been thoroughly revised and simplified, the purpose is to show the contribution of response options to mitigation, adaptation, combating desertification and land degradation, and enhancing food security (now figure SPM3)
29253	17	1	17	12	I suggest avoiding using aggregated emission like you do in table SPM 1. Much better to give information by gas. Aggregating two so fundamentally diferent gases as CO2 and CH4 is highly problematic. And you do not even state which GWPs you have used for this. At LAM1 it was decided to avoid CO2 eq emissions. [Jan Fuglestvedt, Norway]	Noted. While this is a valid point (and one which was taken into consideration) it was not possible due to space limitations to show this level of detail in the figure. We also note that many reviewers suggested simplifying and removing some information.
14507	17	1	17	12	Table SPM1. The difinition of size of impacts are well scaled quantitatively. Keep them. [Shuzo Nishioka, Japan]	Noted.
805	17	1	17	13	the table is very confusing. It needs to be improved to serve communication purposes or be deleted. If it is a summary of previous figure, it is not needed. [, Spain]	Noted. The visual elements of Table SPM1 has been thoroughly revised and simplified (now figure SPM3)
38335	17	1	17	13	More detail is needed on land-based mitigation. If mitigation refers to Figure SPM.1, it may be helpful to reference the figure. [, United States of America]	Accepted. References to the specific tables and sections in Ch6 are provided in the updated technical caption: 'Supporting evidence for the magnitude of the potential and the evidence base for land management-based response options can be found as follows: for mitigation tables 6.13 to 6.20, with further evidence in Section 2.7.1;'
3931	17	1	17	14	Show the lines separating the cells to make Table SPM.1 more readable. [, Switzerland]	Noted. The visual elements of Table SPM1 has been thoroughly revised and simplified (now figure SPM3)
20815	17	1	17	14	Please make this table clearer. It is hard to see where the lines end - what matches up with what. [, United Kingdom (of Great Britain and Northern Ireland)]	Noted. The visual elements of Table SPM1 has been thoroughly revised and simplified (now figure SPM3)
38337	17	1	17	14	The table does not quantify the cost variable in the figure. Cost is a key consideration in the feasibility of any measure or policy. Leaving this information out, will make it more difficult for policymakers to weigh options. [, United States of America]	Noted. The cost variable (now reformatted) is quantified in the revised figure caption.
3027	17	2	17	2	chain management' : dash is needed. [, Russian Federation]	Rejected. Value chain is not hyphenated throughout the SPM text.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
12923	17	5	17	5	Table SPM 1 key. There is no agreed way to combine GHGs to give a CO ₂ -eq. In particular the metrics for methane provided in AR5 WG 1 table 8.7 varied by a factor of 20. The effects of CO ₂ and methane mitigation need to be treated separately here, not combined. i.e. define "Large positive" as either > 3 GtCO ₂ /yr or > n GtCH ₄ /yr or > n GtN ₂ O/yr. [William Collins, United Kingdom (of Great Britain and Northern Ireland)]	Noted. In line with the rest of the SPM the following approach was taken: 'In this report, aggregated emissions of different GHGs are reported in carbon dioxide (CO ₂) equivalents based on Global Warming Potentials with a time horizon of 100 years, without climate-carbon feedbacks, using values from the IPCC Fifth Assessment Report'. Further to this we note that due to space limitations in the figure it would not have been possible to include separate treatment of other GHG's.
7731	17	5	17	6	It may be better to add upper (lower) limit value for Positive small (Negative small) written with inequality. [Hiroaki Kondo, Japan]	Noted. The table of key criteria for the figure has been reformatted.
6127	17	5	17	6	It would be good to improve the quality of the Table SPM1; in fact, if possible, add a line under each key criteria in order to separate things. This would avoid any confusion. [Jacques-Andre Ndione, Senegal]	Noted. The visual elements of Table SPM1 has been thoroughly revised and simplified (now figure SPM3).
2031	17	5	17	6	In Table SPM1, it would help the reader if the authors split the different entries into rows (and perhaps columns). [William Lahoz, Norway]	Noted. The visual elements of Table SPM1 has been thoroughly revised and simplified (now figure SPM3)
12927	17	5	17	7	There needs to be consistency between the use of "per year" and "yr-1". Don't mix both. [William Collins, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. 'yr-1' has been adopted throughout.
3933	17	6	17	6	As the "technical potential" is not defined in the current Glossary, the reader may imagine that this is e.g. the maximum GHG mitigation that a response option may yield. Could it be possible to provide a realistic view of how much of this "technical potential" (or "ideal potential") is finally realized, after taking into account economic, regulatory, market and cultural barriers? [, Switzerland]	Noted. This represents the biophysical potential which is defined differently in the literature assessed. Technical potential was used in IPCC AR5. See IPCC AR5 for definition
29251	17	7	17	7	The equation " $\sim 1 \text{ GtC yr}^{-1} = 3.67 \text{ GtCO}_2\text{e yr}^{-1}$ " needs correction. Mixing in equivalence here when you mean transferring between C and CO ₂ in the units makes no sense. Thus, delete the "e" after "CO ₂ ". [Jan Fuglestedt, Norway]	Accepted. This has been removed from the technical caption
12925	17	7	17	7	This statement $1 \text{ GtC yr}^{-1} = 3.67 \text{ GtCO}_2\text{e yr}^{-1}$ conflates the simple molecular mass conversion with the idea of CO ₂ -equivalence. It is not obvious the GtC to GtCO ₂ conversion needs to be provided here as GtC isn't used in the table. More importantly the concept of CO ₂ -equivalence is not well defined and depends strongly on the metric used. At the very least these concept and its uncertainty needs to be explained, but I would strongly argue to report the different GHGs separately. [William Collins, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. This has been removed from the technical caption
29927	17	8	17	9	We are not sure why lives lost is the measure here. It seems to be a bit extreme. It could also relate to ecosystems and quality of life. [, Estonia]	Noted. The table has been redrawn. The values shown in the table for adaptation, desertification, land degradation and food security are millions of people affected for each response option. In terms of adaptation this has been scaled relative to lives lost.
17331	17		17		Table SPM1 is difficult to read - there should be more space separating the different levels of effect (Large, Positive, etc) so that the [Maria Helena Cruz de Carvalho, France]	Noted. The visual elements of Table SPM1 has been thoroughly revised and simplified (now figure SPM3)
16459	17	1			It is very difficult for general people to understand Table SPM 4. There may be no need in this SPM. [, Republic of Korea]	Noted. The visual elements of Table SPM1 has been thoroughly revised and simplified (now figure SPM3)

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38339	17	1			"CO2e" is never defined. And, for consistency, should it not be "CO2eq" as elsewhere in the SPM? [, United States of America]	Partially accepted. CO2 eq is now used throughout. Regarding definition of CO2eq - in line with the rest of the SPM the following approach was taken: 'In this report, aggregated emissions of different GHGs are reported in carbon dioxide (CO2) equivalents based on Global Warming Potentials with a time horizon of 100 years, without climate-carbon feedbacks, using values from the IPCC Fifth Assessment Report'.
2257	17	10			"1-6 billion hectares of currently degraded land" - does this include dryland and non-dryland currently degraded land? [Nina Hunter, South Africa]	Noted. The technical caption for Table SPM1 (now Figure SPM3) has been revised including the following clarification: 'For desertification and land degradation, magnitudes are set relative to the lower end of current estimates of degraded land, 10-60 million km2 (Gibbs and Salmon 2015).'
23761	17				Table SPM 1 is too crowded or cluttered. Need to give proper row spaces after each of row of information to make it reader friendly [, India]	Noted. The visual elements of Table SPM1 has been thoroughly revised and simplified (now figure SPM3)
26249	17				Table SPM1: In the column mitigation it would be better to talk about additional release of GHG, instead of negative numbers, which might not be clear to policy makers [, Luxembourg]	Rejected. The use of negative numbers is retained in the updated version as this is in line with the underlying data in Ch6.
26251	17				Table SPM1: Note: the meaning of "combined target to meet 100 GtCO2 in 2100" is not clear. Which target is referred to in this sentence? [, Luxembourg]	Noted. The caption for Table SPM1 has been revised, new text: 'For mitigation, potentials are set relative to the approximate potentials for the mitigation options with the largest individual impacts (~3 GtCO2-eq yr-1) (Pacala and Socolow 2004). The threshold for the "large" category is set at this level.'
16461	17				In Table per year--> yr-1 or y-1 [, Republic of Korea]	Accepted.
2255	17				Is it possible to draw horizontal lines under each issue? As it currently stands it is difficult to read and confusing. For example, a line under the rows that have to do with "Large Positive", a line under the "Moderate Positive" row etc. [Nina Hunter, South Africa]	Noted. The visual elements of Table SPM1 has been thoroughly revised and simplified (now figure SPM3)
13321	18	1	4	18	B3. Future climate change mitigation pathways could contribute 1 to the shaping of the land system. The majority of assessed climate mitigation scenario pathways for 2030, 2050, and 2100 include substantial changes in the global area of forests, pasture, and other ecosystems, including food crops, and land dedicated to bioenergy crops (high confidence). {1.3.2, 6.2.4, Figure SPM 5} [Marina Rosales Benites de Franco, Peru]	Thank you for your comment. Statement has been revised and merged with other bullets in the SPM
12595	18	15	16	15	Suggestion addition at the end of the paragraph: Further, carbon benefits will only be reaped with strong governance for the implementation of CDR techniques, paying due attention to land rights and gender issues. Additionally, due attention must also be paid to the risk of biodiversity loss and soil depletion associated with land use change for CDR techniques. [Carina Millstone, United Kingdom (of Great Britain and Northern Ireland)]	Noted. Governance is addressed in SPM Section C
33571	18	1	18	1	Avoid "could" and make a clear statement and add the uncertainty assessment [Andreas Fischlin, Switzerland]	Noted. Uncertainty language added where appropriate
6051	18	1	18	1	Change "could" for "most likely will", as the findings of the IPCC SR 1,5 indicate that all pathways require the use of CDR, which comes, among other, from afforestation. It is also more coherent with the following sentence which points to "substantial changes in the global area" [, Poland]	Thank you for your comment. Statement has been revised and merged with other bullets in the SPM
4911	18	1	18	2	We would suggest clarifying the level of emission pathways assumed here. Descriptions of specific years such as "for 2030, 2050, and 2100" seem not necessarily to be linked to the specific emissions pathways. If so, we would suggest replacing the description to "from 2030 to 2100". [, Japan]	Thank you for your comment. Statement has been revised and merged with other bullets in the SPM
38341	18	1	18	2	"Shaping the land system" may not have a clear meaning to readers. Suggest a more specific formulation. [, United States of America]	Thank you for your comment. Statement has been revised and merged with other bullets in the SPM

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6863	18	1	18	2	The sentence is rather euphemistic. I would propose to rather say: " future climate change mitigation pathways could imply large and unprecedented changes in the land system with far reaching consequences and potentially adverse impacts other SDGs" [Markus Giger, Switzerland]	Thank you for your comment. Statement has been revised and merged with other bullets in the SPM
31575	18	1	18	4	Add the following text after the end of the last sentence in current paragraph B3: "In most scenarios compatible with stabilisation at 2°C, land-based negative emission technologies such as afforestation, reforestation, intensified land management, and bioenergy crops will need to be implemented on very large land areas. Even larger land areas are required in scenarios aimed at keeping average global temperature increases to below 1.5 °C {4.7.1}." Justification: this is an extremely central piece of information from the report, extracted from the IPCC 1.5 Report (IPCCC 2018) which was not explicitly mentioned at an appropriate paragraph, like B3, in the current SPM draft. (C3/C3.1 of IPCC1.5) [, Brazil]	Thank you for your comment. Statement has been revised and merged with other bullets in the SPM (see new B7)
25951	18	1	18	4	The mitigation options considered here mainly focus on negative emissions whereas the deep reduction of emissions, in land sector as in any other sector, should be the priority for mitigation. This paragraph should be rewritten to better reflect this, and a subparagraph should be added, dedicated to the deep reduction of emissions. [, France]	Thank you for your comment. Statement has been revised and merged with other bullets in the SPM
24573	18	1	18	4	More definite statements about land use scenarios for 2030 and 2050 would be useful [, Ireland]	Accepted and detail provided in new Figure SPM4
38343	18	1	18	4	Include reference to the IPCC 1.5°C Special Report ({SR 1.5}). [, United States of America]	Provided in the underlying chapters
17403	18	1	18	4	"if emission cuts in all sectors are not achieved on a global scale" should be added to this paragraph. [Taehyun Park, Republic of Korea]	Thank you for your comment. Statement has been revised and merged with other bullets in the SPM
32911	18	1	18	10	Don't reify the information that IAMs produce. In many, many places in the report, IAM outcomes are talked about as if they are reality. Pathways are described as if they are real, rather than hypothetical scenarios. This is deceptive and dangerous. [Doreen Stabinsky, United States of America]	Thank you for your comment. Statements have been revised and merged with other bullets in the SPM (see new B7)
33911	18	1	18	20	Consider to include some sentences also around RCP 4.5 and 8.5. [, Norway]	Thank you for your comment. Statements have been revised and merged with other bullets in the SPM (see new B7)
23505	18	1	18	20	The word Pathway often appears in the text. Since it is a path, the reaction in the figure is not very obvious. [Huai Jianjun, China]	Thank you for your comment. Statements have been revised and merged with other bullets in the SPM (see new B7)
23587	18	1	18	20	The word Pathway often appears in the text. Since it is a path, the reaction in the figure is not very obvious. [Huai Jianjun, China]	Thank you for your comment. Statements have been revised and merged with other bullets in the SPM (see new B7)
14509	18	1	18	21	Land use change heavily relates to basic human needs such as food and hunger. On the contrary, many energy related mitigation measures are for reducing extravagant consumption. Pick-up here, if there are some evidences on the comparisons of reduction costs between those two approach. [Shuzo Nishioka, Japan]	Thank you for your comment. Statements have been revised and merged with other bullets in the SPM (see new B7)
29255	18	2	18	2	It would be useful if you could briefly say something more about what types of scenarios these are in terms of temperature outcome. [Jan Fuglestedt, Norway]	Accepted. Statements have been revised and combined with other statements (see new B7)
29645	18	2	18	4	This sentence puts the focus on bioenergy crops in the mitigation context, which is fine given its importance in current mitigation pathways. However, alternative land-based mitigation options mentioned in B3.3 should also be mentioned in this head statement in order to reduce the impression that we face a single choice between bioenergy crops and agricultural land or forests. The solutions that partly avoid (or displace) this dilemma (including for example dietary changes and reducing deforestation) could be even more important. [, Saint Lucia]	Accepted. New HS (B7) emphasises portfolio of mitigation options

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20817	18	2	18	4	The phrase 'for 2030, 2050 and 2100' could be deleted, and the phrase 'as early as 2030' could be added to the end of the sentence. This clarifies that the year attributed to the pathway is irrelevant, but emphasises that there are substantial near-term changes associated with land in these scenarios. [, United Kingdom (of Great Britain and Northern Ireland)]	Harmonised. Statements have been revised and merged with other bullets in the SPM (see new B7)
16463	18	3	18	4	Sentence 'food crops, and land dedicated to bioenergy crops' would be like to change 'land cultivated food and bioenergy crops'. [, Republic of Korea]	Thank you for your comment. Statements have been revised and merged with other bullets in the SPM (see new B7)
29931	18	5	18	5	For RCPs please give temperature impacts by 2100 here and elsewhere. This would make the report more consistent since above impacts of 1.5 and 2 degree pathways are given. [, Estonia]	Statements have been revised and merged with other bullets in the SPM (see new B7). Reference to RCP removed for clarity
30397	18	5	18	5	B3.1 RCP 2.6 scenario should be introduced properly. [, Netherlands]	Statements have been revised and merged with other bullets in the SPM (see new B7). Reference to RCP removed for clarity
3935	18	5	18	5	Why, in this paragraph B3.1, not to refer to the various RCPs represented in Figure SPM 5 instead of only referring to RCP 2.6? [, Switzerland]	Thank you for your comment. Statements have been revised and merged with other bullets in the SPM (see new B7)
20819	18	5	18	5	A non expert will not be familiar with the term 'Representative concentration pathway', and would thus struggle to understand B3.1. at a minimum, it should be stated that this broadly corresponds to a 2°C target; ideally, it should be replaced with a broader statement that discusses the extreme values in forest area change across all modelled scenarios (including RCP1.9), which could then be framed as 'In order to achieve the temperature goal of the Paris Agreement, global forest area is projected to change by up to...' [, United Kingdom (of Great Britain and Northern Ireland)]	Statements have been revised and merged with other bullets in the SPM (see new B7). Reference to RCP removed for clarity
38345	18	5	18	6	"In Representative Concentration Pathway (RCP) 2.6 scenarios, the global forest area is projected to change, ranging from a reduction of about 500 Mha up to an increase of 1000 Mha in 2100 compared to 2010." "...projected to change..." is an odd formulation since the models do not even agree on sign. Suggest stating instead, "In Representative Concentration Pathway (RCP) 2.6 scenarios, the change in global forest area is uncertain, ranging from a projected reduction of about 500 Mha up to an increase of 1000 Mha in 2100 compared to 2010." [, United States of America]	Statements have been revised and merged with other bullets in the SPM (see new B7). Reference to RCP removed for clarity
27653	18	5	18	7	"In Representative Concentration Pathway (RCP) 2.6 scenarios, the global forest area is projected to change, ranging from a reduction of about 500 Mha up to an increase of 1000 Mha in 2100 compared to 2010." - Please explain why this might happen and whether this is a prerequisite of the RPC 2.6 or an effect of it. In addition, we thought that RCPs provide concentration/emissions pathways for ESMs that include prescribed forest areas based on SSP/IAM scenarios. Please explain. [, Germany]	Statements have been revised and merged with other bullets in the SPM (see new B7). Reference to RCP removed for clarity
16465	18	5	18	7	Projection in 2100 seems to be inappropriate in this paragraph due to too much far from now. So it'll be better to be described to projection in 2050. [, Republic of Korea]	Thank you for your comment. Statements have been revised and merged with other bullets in the SPM (see new B7)
16467	18	5	18	7	There are many disputes about bioenergy crops to decrease emission of GHG. It is hard to agree with that completely. [, Republic of Korea]	Thank you for your comment. Statements have been revised and merged with other bullets in the SPM (see new B7)
29933	18	5	18	9	What do these numbers mean in terms of availability of land for food production? Would this be sufficient considering growing population numbers? And for which type of diets? [, Estonia]	Thank you for your comment. Statements have been revised and merged with other bullets in the SPM (see new B7). Assessments of land competition included
27655	18	5	18	10	Please put these statements in context by providing current levels as well as percentages. [, Germany]	Thank you for your comment. Statements have been revised and merged with other bullets in the SPM (see new B7)
24575	18	5	18	10	There are a lot of modelled scenarios for land use - the Report could usefully comment on the realistic boundaries for these, i.e. sense-test material on land that was provided in SR1.5 [, Ireland]	Thank you for your comment. See updated Figure SPM4 on illustrative pathways

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
4913	18	5	18	10	B3 mentions the area of forests, pasture, food crop, and land dedicated to bioenergy crop, while B3.1 only mentions the situations of forest area and bioenergy crops; and therefore suggest adding brief summaries about pasture and food crops. [, Japan]	Thank you for your comment. Statements have been revised and merged with other bullets. See updated Figure SPM4 for detail on land cover under different pathways
30177	18	5	18	10	Make clear why only RCP 2.6 is discussed in statement B3.1. Figure SPM 5 also deals with RCP4.5 and RCP1.9. Also make a reference to figure SPM 5. [, Netherlands]	Statements have been revised and merged with other bullets in the SPM (see new B7). Reference to RCP removed for clarity
30237	18	5	18	10	When talking about global areas it would be more consistent to use Mkm2 in stead of Mha. [, Netherlands]	Harmonised throughout SPM
3031	18	5	18	10	It is expedient to unify units: 'million ha' or 'Mha'. [, Russian Federation]	Editorial
29643	18	5	18	10	This statement is only about RCP2.6. What about pathways for limiting warming to 1.5 with no and limited overshoot? [, Saint Lucia]	Statements have been revised and merged with other bullets in the SPM (see new B7). Reference to RCP removed for clarity
17587	18	5	18	10	Could quote also the corresponding SR1.5 findings. [, Sweden]	Thank you for your comment. SR1.5 findings are referenced in the underlying chapters
7733	18	5	18	10	Inconsistent unit: Mha or million ha [Hiroaki Kondo, Japan]	Editorial
6129	18	5	18	10	It would be better to give more precision when we're talking about "global forest areas is projected to change"; what will happen in Africa, in Asia, in South America. Let's try to be more quantitative... [Jacques-Andre Ndione, Senegal]	Thank you for your comment. Statements have been revised and merged with other bullets in the SPM (see new B7)
8591	18	5	18	10	I would harmonize units with A1.2 (Mkm2 or Mha) in order to facilitate comparisons. [Marc Aubinet, Belgium]	Harmonised throughout SPM
8593	18	5	18	10	The numbers given here are huge and question the feasibility of the approach. "huge amounts of land area for ecosystems will be needed to be an effective long-term carbon sink to mitigate anthropogenic carbon emissions. To mine more carbon dioxide from the atmosphere it will be necessary to find suitable locales with adequate water and sunlight. Much land is not available or is unsuitable because it is already dedicated to providing food and fiber for a burgeoning world population, it is privately owned, or it is too cold or too dry to support significant and additional rates of carbon uptake. " (Baldocchi and Penuelas 2018, Glob Chang Biol. 2018 Dec 27. doi: 10.1111/gcb.14559.) [Marc Aubinet, Belgium]	Noted. SPM statements drawn from underlying chapters, which are based on the available scientific literature
22101	18	5	18	10	B3.1-Please check: If such huge area of land is required for generation of bioenergy crops, there will surely be adverse impacts on food production for global population leading to food insecurity. In terms of land-based climate change mitigation by sequestering CO2-C in soil, there will be detrimental effect soil carbon cycle if such large fraction of land comes under bioenergy production. Is it really feasible/practicable to produce bioenergy on such a vast tract of land? [Suvadip Neogi, India]	Statements have been revised and merged with other bullets in the SPM (see new B7). Reference to land competition now included
4917	18	6	18	6	Projected global forest area in RCP 2.6 scenario is written in the range "from a reduction of about 500 Mha up to an increase of 1000 Mha in 2100" while the corresponding error bar of 26/Forest in Figure SPM 5 seems not reach to -500. Could you revise the text or figure to ensure consistency between them? Same issue can be found in underlying Chapter 2 (p 2.7 L17-18 and Figure 2.35) as well. [, Japan]	Statements have been revised and merged with other bullets in the SPM (see new B7). Reference to RCP removed for clarity
30179	18	6	18	6	This line is inconsistent with figure SPM 5. From figure SPM 5 it follows that changes in global forest area in RCP2.6 ranges from about 0 to 1000 Mha in 2100. So where does the reduction of 500 Mha comes from? [, Netherlands]	Statements have been revised and merged with other bullets in the SPM. Cross-checked with figure
3937	18	6	18	6	Express areas in square km (km**2) instead in ha. The last IPCC report (SR1.5) has adopted the practice of expressing areas in square km (km**2). [, Switzerland]	Harmonised throughout SPM

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7735	18	6	18	6	"ranging from a reduction of about 500 Mha up to an increase of 1000 Mha in 2100": It seems that the lower end of vertical line is around -250 for forest, RCP 2.6 in 2100 in Figure SPM 5. [Hiroaki Kondo, Japan]	Statements have been revised and merged with other bullets in the SPM (see new B7). Reference to RCP removed for clarity
4915	18	6	18	8	The units used are "Mha" for forest land and "million ha" for others. It might be better to use consistent unit across the text. [, Japan]	Harmonised throughout SPM
33913	18	7	18	9	Specify unit and duration. Is the "demand for bioenergy sourced from about 200–1,500 million ha" for which period? [, Norway]	Accepted
20821	18	7	18	9	Please could you stick with either km2 or ha? Switching between the two means it is hard to compare numbers. Also the implications of bioenergy use are wider than that listed here. [, United Kingdom (of Great Britain and Northern Ireland)]	Harmonised throughout SPM
27657	18	7	18	10	"Demand for second generation bioenergy crops can range from less than 5,000 up to about 20,000 million tonnes per year, sourced from about 200–1,500 million ha of land (robust evidence, high agreement). Changes in land use on this scale have important implications for land carbon storage and biophysical effects on regional temperature." - Please explain what kind of implications this will have (also on other kind of land use, i.e. food production). Is it therefore realistic to increase the area of biomass production for energy use by such an extent? [, Germany]	Thank you for your comment. Statements have been revised and merged with other bullets in the SPM (see new B7). Assessments of land competition included
3939	18	8	18	8	Express areas in square km (km**2) instead in ha. The last IPCC report (SR1.5) has adopted the practice of expressing areas in square km (km**2). [, Switzerland]	Harmonised throughout SPM
4919	18	9	18	9	Readers are hard to understand the meaning of "important implications". Please add more detailed explanations. [, Japan]	Accepted
13127	18	10	18	10 As well as biodiversity and ecosystem functions. [David Cooper, Canada]	Thank you for your comment. Statements have been revised and merged with other bullets in the SPM (see new B7)
6865	18	10	18	10	Add to the sentence: "as well as on other SDGs such food security or biodiversity conservation". [Markus Giger, Switzerland]	Thank you for your comment. Statements have been revised and merged with other bullets in the SPM (see new B7)
23037	18	11	18	15	The statement should add something about the circumstances under which 'payback' from land conversion to bioenergy would be shorter/shortest - and under what circumstances synergies could be maximised and trade-offs minimised. [Anastasios Kentarchos, Belgium]	Statement has been revised (now B5). B5.2 includes detail on scale
13129	18	11	18	15	also refer to indirect LUC, and associated uncertainties [David Cooper, Canada]	Thank you for your comment. Statements have been revised and merged with other bullets in the SPM (see new B7)
13131	18	11	18	15	Message B4 is presented in a very negative way. However, reforestation, some aspects of afforestation, and other ecosystem restoration, could have positive synergies with some SDGs related to biodiversity, climate adaptation, disaster risk reduction etc. [David Cooper, Canada]	Statement has been revised (now B5). Synergies and co-benefits addressed in separate statement (B6)
32913	18	11	18	15	This comment also applies to the discussion in the underlying chapter on pp. 102-104. The phrasing here does not quite capture the conclusions of Harper et al. and seems to misinterpret them. Ideally the phrasing in the report would be more aligned with the content of the paper, which looks at the NET LOSS of carbon, even over the long term, from BECCS. The paper also concludes that forest-based mitigation (i.e., not cutting them down) "has a wide range of co-benefits..." Read the paper again and revise the treatment in the chapter to correct the current mis-interpretation. [Doreen Stabinsky, United States of America]	Statement has been revised (now B5). Statements in SPM based on findings in the underlying chapters, which are based on an assessment of available scientific literature
25953	18	11	18	15	This paragraph is important and should be kept as it is. [, France]	Thank you for your positive comment.
4401	18	11	18	15	We support the inclusion of this material in the SPM [, New Zealand]	Thank you for your positive comment

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20823	18	11	18	15	B3.2 could be more explicit in its discussion of the effect of land use change on GHGs to be more clear to the reader. For example 'In land that has a high carbon stock, the carbon benefits of land protection are greater in the short term than converting land to bioenergy crops, which could lead to an overall release of greenhouse gasses into the atmosphere that takes several harvest cycles to reabsorb'. [, United Kingdom (of Great Britain and Northern Ireland)]	Thank you for your comment. Statements have been revised and merged with other bullets in the SPM (see new B7).
38347	18	11	18	15	B3.2 notes that, in land with a high carbon stock, the carbon benefits of land protection are greater in the short-term than converting land to bioenergy crops. This paragraph should also note the converse and point out the cases where converting land to use for bioenergy crops can have carbon benefits. {SR 1.5} [, United States of America]	Statement has been substantially rewritten and revised in response to reviewer comments
32389	18	11	18	15	This statement fails to take into account a proper assessment of multiple counterfactual land use change scenarios (see also Searchinger et al., 2017). For example, Lihares de Rezende et al. (2015) found that many of the pasture lands in the Brazilian Atlantic Forest Zone, which are currently carbon poor, would grow back into forest within a couple of decades in a set-aside scenario. Using such lands for afforestation and/or bioenergy production thus causes significant opportunity costs from a carbon sequestration perspective. [Simone Lovera-Bilderbeek, Paraguay]	Statement has been substantially rewritten and revised in response to reviewer comments
32471	18	11	18	15	Searchinger, T.D., Edwards, R., Mulligan, D., Heimlich, R., Plevin, R., 2015a. Do biofuel policies seek to cut emissions by cutting food? Science 347, 1420–1422. http://dx.doi.org/10.1126/science.1261221 . [Simone Lovera-Bilderbeek, Paraguay]	Thank you for the reference. However, statements in the SPM are based on assessment in the underlying chapters
32517	18	11	18	15	Linhares de Rezende, C., Uezu, A., Scarano, F. and Dunn Araujo, D., 2015. Atlantic forest spontaneous regeneration at landscape scale. Biodiversity Conservation 2015:24 (2255 - 2272) [Simone Lovera-Bilderbeek, Paraguay]	Thank you for the reference. However, statements in the SPM are based on assessment in the underlying chapters
22103	18	11	18	15	B3.2-Please check: '.....carbon benefits of land protection are greater in the short-term.....'short-term only? Not long-term? This is beneficial from the view point of environmental and ecosystem sustainability in long-run also. [Suvadip Neogi, India]	Thank you for your comment. Statements have been revised and merged with other bullets in the SPM (see new B7).
17405	18	11	18	15	Besides the fact that combustion energy systems based on biomass should not be further supported by a report like this, this paragraph could make a reference to the fact that an increase in demand for bioenergy will create further conflicts over land, if pasture use is not massively reduced for meat production. [Taehyun Park, Republic of Korea]	Statement has been revised and updated (B5). New sub-bullet on food security added
27661	18	12	18	15	Please rethink the misleading phrase "which can take several harvest cycles to "pay-back" the carbon lost". The terms "several" (few?) and "harvest cycle" are not well defined, do you refer to perennial plants or wood products, or annual crops? Considering the high amount of carbon stored in peatlands, emissions from drained organic soils can remain higher than biomass production for several decades or even hundreds of years, and soil fertility of drained peatlands is often deteriorating rapidly. Also in forestry even one harvest cycles can be more than a century. Please give more clarity. [, Germany]	Statement has been substantially rewritten and revised in response to reviewer comments
33915	18	12	18	15	We suggest to include some considerations on both geographical and forest type variations in this conclusion. In addition, the text in the SPM should reflect better on how the temporary emission from harvest affects the climate system. There are information relevant for forest management in chapter 4.7.6 that describes many perspectives that are very policyrelevant in this context. We feel the current formulation is of a to generic nature and actually does not give enough information since both forest, grassland/savannah and peatlands are lumped together. [, Norway]	Statement has been substantially rewritten and revised in response to reviewer comments

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20825	18	12	18	15	Why are the benefits of protection described as better in the short term only for peat (and forests) given that in chapter 2, section 2.7.1.2.5, p102 lines 27-32 payback on different peats is 100 years? [, United Kingdom (of Great Britain and Northern Ireland)]	Statement has been substantially rewritten and revised in response to reviewer comments
17589	18	13	18	14	It is not clear what the core message is here. What are the conclusions on these two options? How effective they are / how could they be best used in mitigation. [, Sweden]	Statement has been substantially rewritten and revised in response to reviewer comments
24577	18	13	18	15	Strong statement that warrants more elaboration in the context of scenarios that include significant land use changes [, Ireland]	Statement has been substantially rewritten and revised in response to reviewer comments
3033	18	14	18	14	'pay-back' is a jargon; all the text should be dejargonized. [, Russian Federation]	Accepted. Jargon removed
30835	18	14	18	14	this significantly understates the risk – in some places with already high carbon stocks, bioenergy would never pay back the carbon lost or take many centuries to do so (e.g. cold wet peatlands, old growth forests). [Mike Morecroft, United Kingdom (of Great Britain and Northern Ireland)]	Statement has been substantially rewritten and revised in response to reviewer comments
4923	18	16	18	16	The targets of “climate change targets” are not clear enough. We would suggest clarifying it (e.g., specifying that it means 2°C and/or 1.5°C targets in the Parris Agreement or explaining what level of mitigation pathways are assumed). [, Japan]	Statement has been substantially rewritten and revised in response to reviewer comments
12985	18	16	18	17	B3.3. A small number of scenarios describe pathways that achieve climate change targets with less need for carbon dioxide removal (CDR) techniques requiring large areas of land.' Not clear if the CDR requires large areas of land, or the scenarios require this elsewhere. [Aidan Farrell, Trinidad and Tobago]	Accepted and statement revised to clarify
11649	18	16	18	17	IPCC certainty language is missing [Linah Ababneh, Sweden]	Accepted and uncertainty language added
8855	18	16	18	19	message should be simplified for clarity. Perhaps deletion of the last clause will make message simple and clearer. [Jean-Luc Chotte, France]	Accepted and statement revised to clarify
23039	18	16	18	20	Add some examples to highlight the extent of the lifestyle changes and/or intensification required in order to minimise CDR. 50% reduction in meat consumption? Extensive pasture disappears (to be replaced with what land cover)? [Anastasios Kentarchos, Belgium]	Statement has been substantially rewritten and revised in response to reviewer comments
24579	18	16	18	20	Quantification of the technical potential of land to provide a sink for carbon would be useful here [, Ireland]	Statement has been substantially rewritten and revised in response to reviewer comments. Quantification added where possible and appropriate
24653	18	16	18	20	Overall data on the accumulation of carbon to the terrestrial systems over the last century, as well as projections to the end of the century, would be of interest [, Ireland]	Statement has been substantially rewritten and revised in response to reviewer comments. Quantification added where possible and appropriate
24677	18	16	18	20	The basis for the statement on livestock is unclear. This should be addressed or deleted [, Ireland]	Statement has been substantially rewritten and revised in response to reviewer comments
17593	18	16	18	20	Could refer to SR1.5 findings here as well. [, Sweden]	Noted
20827	18	16	18	20	B3.3 would be better placed underneath section B4, as it nicely describes how you can avoid relying on high levels of CDR, some of the challenges of which are described in B4. [, United Kingdom (of Great Britain and Northern Ireland)]	Accepted, statements in SPM Section B re-ordered for better narrative flow

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38349	18	16	18	20	Section B3.3 notes that, "a small number of scenarios describe pathways that achieve climate change targets with less need for CDR techniques requiring large areas of land." While it is true that a small number of scenarios achieve climate change targets without BECCS, in the context of the IPCC 1.5°C Special Report, this statement is misleading, as there are other large land requirements in these scenarios. The SR 1.5 scenarios that avoid BECCS have higher utilization of afforestation and bioenergy. From C3.2 in the SPM of SR 1.5, "Some pathways avoid BECCS deployment completely through demand-side measures and greater reliance on AFOLU-related CDR measures (medium confidence). The use of bioenergy can be as high or even higher when BECCS is excluded compared to when it is included due to its potential for replacing fossil fuels across sectors (high confidence)." [, United States of America]	Statement has been substantially rewritten and revised in response to reviewer comments
1497	18	16	18	20	This para on some CDR methods is only understandable with reference to B4 on CDR, which makes it confusing to read it early on, before the reader has learned about land-intensive CDR methods. It should be moved into B4 (or B3 should be shifted backwards in the SPM so that it follows the CDR subchapter [Oliver Geden, Germany]	Accepted, statements in SPM Section B re-ordered for better narrative flow
17809	18	16	18	20	There is little information on deforestation in the SPM. In this paragraph or elsewhere the timescale for reversing net deforestation could be given (e.g. what do no and limited overshoot 1.5 scenarios show regarding CO2 emissions from deforestation? Do deforestation emissions need to go down much faster in scenarios with less CDR?) to highlight the need for near-term action, and the co-benefits of such action should also be included (biophysical effects, benefits for biodiversity etc.) [Quentin Lejeune, Germany]	Accepted and included in SPM Section B and Section D, as well as SPM Figure3
17407	18	16	18	20	It would be highly important to further explore the key features of pathways that seek to minimise additional / unnecessary / unrealistic demand on land - both in the underlying 2.7.2 chapter itself as well as in the SPM here. What's critical in these pathways is radically accelerated near-term action (way beyond current NDCs), with a particular focus on demand-side measures to reduce demand for energy and land. [Taehyun Park, Republic of Korea]	Thank you for your comment. Statement revised to clarify. Need for early action also address in SPM Section D
22105	18	16	18	21	B3.3-Please check: '.....agricultural intensification in which reduced cattle stocks play an important role.....'.....Is it really practicable/feasible to have agricultural intensification with reduced cattle stock in future keeping in mind the burgeoning population? Else researchers should think of technological interventions for lower emission intensities due to the use of better feeds and management practices. [Suvadip Neogi, India]	Statement has been substantially rewritten and revised in response to reviewer comments
27663	18	17	18	20	"These pathways rely on lifestyle changes and agricultural intensification in which reduced cattle stocks play an important role, with rapid and early reduction of GHG emissions and earlier CDR in the land sector as well as in other sectors (robust evidence, high agreement). {2.7.2, 5.5.1}" - Please explain in an extra paragraph the potentials of changes in diets with focus on consuming less meat and animal products. Please see also our comments on section B5.4. [, Germany]	Statement has been substantially rewritten and revised in response to reviewer comments
26253	18	18	18	18	What is the interplay between intensification and reduced cattle stock? [, Luxembourg]	Statement has been substantially rewritten and revised in response to reviewer comments
20829	18	18	18	18	Is it purely cattle stocks or all forms of ruminants or livestock? Please clarify. [, United Kingdom (of Great Britain and Northern Ireland)]	Statement has been substantially rewritten and revised in response to reviewer comments
4925	18	19	18	19	We would suggest clarifying whether the "in other sectors" mean "CDRs in sectors than the land sector". If it is so, it would be helpful for understanding to add some detailed examples of the CDRs. [, Japan]	Statement has been substantially rewritten and revised in response to reviewer comments

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4927	18	19	18	19	We would suggest revising the phrase "Early reduction of GHG emissions and earlier CDR", to avoid misunderstanding that "CDRs should be conducted earlier than GHGs emissions". [, Japan]	Statement has been substantially rewritten and revised in response to reviewer comments
17591	18	19	18	19	What does CDR in other sectors refer to? Unclear. [, Sweden]	Statement has been substantially rewritten and revised in response to reviewer comments
807	18	21	18	21	We would like to ask for the addition of a paragraph on the treatment of land mitigation in the SR1.5. We miss this part in the SPM, and we think it would be very valuable. [, Spain]	Statement has been substantially rewritten and revised in response to reviewer comments
40401	18		18		"several harvest cycles to "pay back" the carbon lost : please check carefully the validity of this statement (e.g. replacement of peat land by e.g. palms for oil). [Valerie Masson-Delmotte, France]	Statement has been substantially rewritten and revised in response to reviewer comments
30105	18	11	19	15	It would be more balanced to also indicate in what circumstances bioenergy would be appropriate and result in a win-win for both carbon stocks and mitigation of fossil fuel use. Daioğlu et al 2018 ("Integrated assessment of biomass supply and demand in climate change mitigation scenarios") explores bioenergy use in IMAGE under different SSPs. The main message is that socio-economic and technological assumptions really lead to different bioenergy supply, conversion and use possibilities, and thus very different emission mitigation potentials. The most powerful figure is figure 9, which shows that depending on the land-use policies, you could (i) provide a lot of bioenergy with very low LUC, or (ii) provide a small amount of bioenergy with high LUC (compare SSP1 and SSP3). [, Netherlands]	Statement has been substantially rewritten and revised in response to reviewer comments
27649	18	1	21	25	In B3 and B4 we find the discrepancies between the scale of CDR use in mitigation scenarios and the biophysical/socioeconomic limits to CDR could be delivered with more emphasis and with more quantitative supporting evidence. To do this we suggest including a paragraph in the suggested section on CDR based on i.a. the following text passages throughout the report: -Ch4. Pg 39, lines 33-38 (suggest word for word as the bold statement introducing the paragraph - as the following statements all give further support to this statement) -Ch1. Pg 23 lines 11-15 (especially this one we suggest stating word for word, as it is short, poignant and has a confidence of "virtually certain" and displays robust evidence with 11 studies cited, at least some of which are metastudies) -Ch1. Pg23 lines 4-11 -Ch5. Pg 78 line 32 - Pg 79 line 2 (we suggest a compact summary and possibly including the figure 5.17 as visual evidence) [, Germany]	Statement has been substantially rewritten and revised in response to reviewer comments. Quantification added where possible and appropriate
4921	18	16	21	25	It could be worth including textual information on land use change area corresponding to each RCP. Figure SPM5 gives us the impression that the lower the RCP pathway, the more CDR is required, which then leads to increased forest area and bioenergy crop area and decreased food crop area and pasture. This could be mentioned under Section B3 or B4. [, Japan]	Statement has been substantially rewritten and revised in response to reviewer comments. Figure SPM4 includes land use in different pathways
221	18	1	22	2	This section and others underestimates the potential cost to society of afforestation or reforestation in terms of higher food costs. Land is finite. If massive areas are converted to forests, food prices will increase. This is documented in the literature. [Wallace Tyner, United States of America]	Statements substantially rewritten and revised in response to reviewer comments. Statement on food security added (B5.5)
2153	18	11	23	7	This discussion of GHG emissions ignores the role of non-GHG climate change pathways. The options discussed for reducing GHG pathways have quite distinct implications for non-GHG forcing mechanisms resulting from land use change. Policy makers should be aware of that. [David Kaimowitz, Nicaragua]	Statement has been substantially rewritten and revised in response to reviewer comments

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23263	18	1			Change 'could contribute to the shaping of' to just 'could effect' or 'could affect' depending on which school of grammar you take note of. [Mark Howden, Australia]	Editorial
27651	18	2			Why do you mention three specific years? Please consider replacing by "throughout this century". [Germany]	Statement has been substantially rewritten and revised in response to reviewer comments
15897	18	6			i) what do they consider as forest? semi-natural forest ecosystems only or fast growing ligniculture?ii) the increase of forests is jeopardized by the impacts of extreme climatic events and climate change itself. This is a limitation of the models. [Caroline Vincke, Belgium]	Statement has been substantially rewritten and revised in response to reviewer comments
2095	18	8			Robust Evidence/high agreement [Tomas Molina, Spain]	Confidence language checked in accordance with IPCC guidelines
2097	18	10			Robust Evidence/high agreement [Tomas Molina, Spain]	Confidence language checked in accordance with IPCC guidelines
27659	18	11			Please add "use" in "land use change occurs". [Germany]	Noted. Checked
15901	18	12			i) prior land use is a very important aspect. ii) plus bioenergy crops have less ecosystem services than (semi)-natural ecosystems. [Caroline Vincke, Belgium]	Noted
15899	18	16			and also depends of the duration between the set up of the option and its evaluation [Caroline Vincke, Belgium]	Noted. Checked
15903	18	16			B33: very important. Deglobalizing strategies. [Caroline Vincke, Belgium]	Thank you
2099	18	19			Robust Evidence/high agreement [Tomas Molina, Spain]	Confidence language checked in accordance with IPCC guidelines
28705	18				B3.2: "The carbon benefits of land protection...". There may be cases where carbon benefits pay off in the longer term, though when indirect land use change is included there are rarely benefits to land conversion to bioenergy crops. Further, much of the bioenergy expansion currently and in future will involve use of wood, and trees require far longer payback periods. Given the IPCC has stated that the timeline for addressing climate change is on order of a decade, it makes no sense to assume longer payback periods are a climate benefit. Similarly, if the goal is to decrease GHG concentrations in the atmosphere, using land based mitigation, then cutting and burning plant biomass will increase, not decrease emissions. Relevant references following comment. [Rachel Smolker, United States of America]	Statement has been substantially rewritten and revised in response to reviewer comments
28707	18				Recent study of carbon debt by Sterman et al [REFERENCE FOLLOWS] "The payback time for this carbon debt ranges from 44–104 years after clearcut, 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" [Rachel Smolker, United States of America]	Thank you for the reference. However, statements in the SPM are based on assessment in the underlying chapters
28709	18				Sterman, J.D., Siegel, L and Rooney-Varga, J.N. 2018. Does replacing coal with wood lower CO2 emissions? Dynamic lifecycle analysis of wood bioenergy. <i>Enviro Res Lett</i> 13. [Rachel Smolker, United States of America]	Thank you for the reference. However, statements in the SPM are based on assessment in the underlying chapters
28711	18				Searchinger, T., Beringer, T. and Strong, A. 2017. Does the World Have Low-Carbon Bioenergy Potential from Dedicated Use of Land? <i>Energy Policy</i> 110, 434-446 [Rachel Smolker, United States of America]	Thank you for the reference. However, statements in the SPM are based on assessment in the underlying chapters

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28713	18				Gunn, JS., Ganz, D.J., Keeton, W.S. 2011. Biogenic vs geologic carbon emissions and forest biomass energy production. GCB Bioenergy [Rachel Smolker, United States of America]	Thank you for the reference. However, statements in the SPM are based on assessment in the underlying chapters
28715	18				Fargione J, Hill J, Tilman D, Polasky S and Hawthorne P 2008. Land clearing and the biofuel carbon debt. Science 319 1235–8 [Rachel Smolker, United States of America]	Thank you for the reference. However, statements in the SPM are based on assessment in the underlying chapters
28717	18				Holtsmark, B. (2012), The outcome is in the assumptions: analyzing the effects on atmospheric CO2 levels of increased use of bioenergy from forest biomass. GCB Bioenergy. doi: 10.1111/gcbb.12015 [Rachel Smolker, United States of America]	Thank you for the reference. However, statements in the SPM are based on assessment in the underlying chapters
12993	19	1	19	1	Fig SPM5- change x-axis from 45 etc. to RCP 4.5, etc. for clarity [Aidan Farrell, Trinidad and Tobago]	Figure SPM5 was removed from the SPM
4929	19	1	19	1	We would suggest using RCP4.5, RCP2.6 and RCP1.9 instead of 45, 26 and 19 respectively in the horizontal axis in Figure SPM 5 in order to improve clarity. [, Japan]	Figure SPM5 was removed from the SPM
33917	19	1	19	1	As it is presented in the draft figure SPM5 seems too complicated to be included in an SPM. Too many factors, too little explanation, and no summary of what the findings would imply for policy advice. [, Norway]	Figure SPM5 was removed from the SPM
17597	19	1	19	1	Figure SPM.5. Suggest adding horizontal lines at zero, in relevant panels, for easier viewing. [, Sweden]	Figure SPM5 was removed from the SPM
20831	19	1	19	1	This figure is quite technical and difficult to understand for a non-expert, as a result of trying to incorporate 5SSPs, 5IAMS, 5 types of land, 4 emissions scenarios and 3 years all on one chart - this would be suitable for the underlying report, but is too complex for a SPM. This could be simplified by using only the mean values, not the full range of uncertainty, and representing the data as a line graph or bar chart plotting - for each crop, and for a given RCP (expressed as a temperature goal) - the absolute value of land area at each of the 4 time points (2010, 2030, 2050, 2100). This would be more easily understandable to the reader, give a reference point (so the change in area as a proportion of total area can easily be seen), and avoid situations like the 2030 column in the current figure where all data sets look very similar, as well as confusion about the significance of the outliers and uncertainty. [, United Kingdom (of Great Britain and Northern Ireland)]	Figure SPM5 was removed from the SPM
14511	19	1	19	1	Figure SPM5: The RCP-wise change of "otherland" (typically seen in 2100) is peculiar than other category such as forest and pasture. What kinds of land-use this "other land" includes and why this happens? Needs some explanation. [Shuzo Nishioka, Japan]	Figure SPM5 was removed from the SPM
27665	19	1	19	9	Figure SPM.5 does not seem to add substantial value to the SPM. We have many concerns as outlined below, please consider replacing the figure by a new paragraph or by a short table. - The bars for 2030 are all close to zero, hence this part of the figure should be omitted. - As expected the intermodel ranges become generally larger with time. - As expected the more ambitious the pathway the less land is used for food production (CropFoodFeed, Pasture) and the more land is used for C-sinks (Forests, CropBioen). The figure for OtherLand are not understandable from the figure without explanation anyway. - The information provided is difficult to understand, because the used terms (e.g. interquartile range) are not explained, neither in the legend nor in the full text (e.g., what does IQRx1.5 tell the reader?). Please see further comments on this figure in chapter 2. [, Germany]	Figure SPM5 was removed from the SPM
30103	19	1	19	9	In the caption to figure SPM5 'Mha' should be changed into 'Gha', except for energy crops. [, Netherlands]	Figure SPM5 was removed from the SPM

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
20833	19	1	19	9	A non-expert will not be familiar with the concept of RCPs, IAMs or SSPs, and this should therefore be explained, or preferably simplified to avoid using those terms. For example, instead of 'across 5 SSPs and across 5 IAMs', the phrase 'across 25 scenarios representing a range of developmental pathways' could be used. Similarly, the RCPs could be replaced with a broad temperature goal that they correspond to, and given the temperature goal of the Paris Agreement, could be limited to baseline, 2C and 1.5C. [, United Kingdom (of Great Britain and Northern Ireland)]	Figure SPM5 was removed from the SPM
38351	19	1	19	9	The number of box plots in this figure makes it difficult to understand. Suggest focusing on fewer variables. [, United States of America]	Figure SPM5 was removed from the SPM
38353	19	1	19	9	Change x-axis labels from "45" to "RCP4.5", etc. Also, would it be possible to add a thin line across each figure at zero (or color the range above zero one color, below zero another color), since the first question is whether each of these land cover classes will increase or decrease (whether box is above or below line)? [, United States of America]	Figure SPM5 was removed from the SPM
29257	19	1	19	9	Figure SPM 5 contains useful info, but I think you could develop this into a figure that is easier to read. And the scenario names on the x-axis could be improved. I also miss some info about the temperature outcome of these scenarios. For many readers it is difficult to understand what the magnitude of the various changes in land use really mean. [Jan Fuglestedt, Norway]	Figure SPM5 was removed from the SPM
3035	19	2	19	3	'Baseline scenario' : where is it defined? [, Russian Federation]	Figure SPM5 was removed from the SPM
4337	19	3	19	3	RCP 1.9 has not been used in past IPCC reports (AR5 and 1.5SR). May need further explanation as this is a new concept. [, Singapore]	Figure SPM5 was removed from the SPM
17595	19	3	19	3	Chapter 2 Executive Summary refers to "Representative Concentration Pathway (RCPs) scenarios" (not ... Pathways/scenarios). Please harmonise. [, Sweden]	Figure SPM5 was removed from the SPM
30181	19	4	19	4	Reference to non-existent Figure 2.7.3 should be changed into a reference to Figure 2.35. [, Netherlands]	Figure SPM5 was removed from the SPM
17603	19	4	19	4	"Figure 2.7.3 (or 2.73)" does not seem to exist. Please correct. [, Sweden]	Figure SPM5 was removed from the SPM
20835	19	4	19	4	Be clear if these are the ranges over all 5 SSPs [, United Kingdom (of Great Britain and Northern Ireland)]	Figure SPM5 was removed from the SPM
8219	19	4	19	4	The figure reference figure 2.7.3. is wrong and should be changed to Figure 2.35 [Harold Leffertstra, Norway]	Figure SPM5 was removed from the SPM
29935	19	5	19	9	Add a note describing what is included in the 'other land category'. [, Estonia]	Figure SPM5 was removed from the SPM
5323	19	5	19	9	figure SPM 5, caption: The information on current areas for pasture, crops, and forests is wrong by a factor of 1000. It is correct in the figure in the underlying chapter. [Klaus Radunsky, Austria]	Figure SPM5 was removed from the SPM
17599	19	7	19	7	The substance meaning of outliers is not readily evident. Do they coincide with true max and min? Or under/overestimate the extremes? [, Sweden]	Figure SPM5 was removed from the SPM
8221	19	7	19	9	The figures for cover of different vegetation types should be multiplied with a factor 1000 to be in line with fig 2.35 in chapter 2. Except for energy crops where 0-14 Mha is correct. [Harold Leffertstra, Norway]	Figure SPM5 was removed from the SPM
3941	19	8	19	8	Express areas in square km (km**2) instead in ha. The last IPCC report (SR1.5) has adopted the practice of expressing areas in square km (km**2). [, Switzerland]	Figure SPM5 was removed from the SPM
17601	19	8	19	9	The very large range for energy crops for 2010 (recent past) seems rather curious. Does one (some?) of the IAMs not include such land use? If not, is it timely for the assessment? [, Sweden]	Figure SPM5 was removed from the SPM
17409	19	8	19	9	The figures given here are in million hectare. If indeed referring to global areas, they'd need to be in billion hectare. [Taehyun Park, Republic of Korea]	Figure SPM5 was removed from the SPM

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
3943	19	9	19	9	Express areas in square km (km**2) instead in ha. The last IPCC report (SR1.5) has adopted the practice of expressing areas in square km (km**2). [, Switzerland]	Figure SPM5 was removed from the SPM
3405	19		19		Figure SPM5: What is "wrt" in y-axis title? "Relative to" ? [Erik Engström, Sweden]	Figure SPM5 was removed from the SPM
4931	19		19		1) The definition of "wrt" (used at the left axis in Figure SPM5) seems missing. 2) Using same words in the figure and its caption may help the readers for clearer understanding ("CropFoodFeed", "CropBioen", etc). [, Japan]	Figure SPM5 was removed from the SPM
24581	19	1	20	7	Information in figures could be usefully elaborated on in the Report. SPM6 can be expanded in table showing mitigation potential. The data should be provided in specific gases as well as CO2eq as this would be clearer. Some foresight exercise is also warranted in terms of emerging options to address emissions [, Ireland]	Figure SPM5 was removed from the SPM
23041	19		20		Figure SPM 5 & 6: as with most SPM figures, their key points need to be highlighted in the text of the SPM itself in order to illustrate the key arguments of the section and/or provide examples. Fig SPM 5 - the information contained in this figure is very important. However, its appearance needs to be improved. In particular, it is challenging to judge the magnitude, and even the sign, of the changes shown due to the different scales for each row and lack of highlighting of the zero line. The design of Figure SPM6 is better in this regard. [Anastasios Kentarchos, Belgium]	Figure SPM5 was removed from the SPM
25955	19	1			We believe this figure is relevant and justified, but we suggest to improve it by different ways: - Differences among SSP should be better illustrated. In particular, we suggest replacing the box plots with sets of SSP-specific points, with a colour code corresponding to each SSP. - The meaning of the abbreviations indicated in the right-hand side of the figure should be given. In particular, it should be explicitly noted that these are energy crops, if this is the case. - In the caption, Mha should be corrected by Mkm2. - The readability of the figure would be greatly improved by using the entire page. [, France]	Figure SPM5 was removed from the SPM
2259	19	2			In the figure, on the horizontal axis, instead of "4.5, 2.6 and 1.9" it states 45, 26 and 19. Please correct. [Nina Hunter, South Africa]	Figure SPM5 was removed from the SPM
15905	19	7			2100? [Caroline Vincke, Belgium]	Figure SPM5 was removed from the SPM
26255	19				Figure SPM5: Please add zero lines to the graphs to make them more easy to read [, Luxembourg]	Figure SPM5 was removed from the SPM
26257	19				Figure SPM5: How is it possible to reduce pasture cover by up to 1000 Mha if the caption says that 3-3.5 Mha are existing? [, Luxembourg]	Figure SPM5 was removed from the SPM
5321	19				figure SPM 5: this figure is very much appreciated. What might be added is the comparison with the actually observed trends in land-use as described in figure SPM 2. [Klaus Radunsky, Austria]	Figure SPM5 was removed from the SPM
13447	19				Figure SPM 5 is difficult to interpret What is the message that this figure is aiming to convey? [Lourdes Tibig, Philippines]	Figure SPM5 was removed from the SPM

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
17811	19				This figure takes the average across the 5 SSPs, which is helpful for showing how significant the influence of socio-economic assumptions is, but it also takes a step away from the approach taken in SR1.5, where different archetypes that are based on different socio-economic pathways are used to show the range of possible outcomes. It would be useful to have a figure that shows more clearly the variation in land-use for different 1.5 degree pathways. Such a figure could also include pathways beyond the RCP pathways (e.g. the LED pathway from SR1.5). The figure should specify what "other land" means. [Quentin Lejeune, Germany]	Figure SPM5 was removed from the SPM
27803	19				It is very difficult for general people to understand Figure SPM5. [Raehyun Kim, Republic of Korea]	Figure SPM5 was removed from the SPM
24361	20	0	20	0	Figure has poor quality. [Renato Braghieri, France]	Figure SPM6 was removed from the SPM
21859	20	1	20	1	There is a question related to forest management in figures SPM 1 and to SPM material on page 15 and in figure SPM 6. Two issues: the term is both forest management and sustainable forest management. The other issue is that it does not seem to be included in action areas like mitigation and adaptation in a consistent way in the figures SPM 1 and SPM 6 and in the materila on the page 20. Please check the consistency and if necessary, please explain possible differences. In our view, it would be logical to include sustainable forest management along with other relevant land management actions e.g also under mitigation in SPM 1. [, Finland]	Figure SPM6 was removed from the SPM
30133	20	1	20	1	It should be indicated for what period the mitigation potentials apply since most options can apply only for a limited period of time. [, Netherlands]	Figure SPM6 was removed from the SPM
33919	20	1	20	1	Figure SPM 6 is interesting, please consider accompanying it by a short description of key results/findings. [, Norway]	Figure SPM6 was removed from the SPM
17605	20	1	20	1	Figure SPM.6: Is the idea that the lower part of the figure is a breakdown of the upper part? (It is noted that the upper part of Agriculture is said to exclude cropland and pasture management, which are listed in the lowe part under Agriculture Management...) Please specify more clearly how the different entries relate to each other. [, Sweden]	Figure SPM6 was removed from the SPM
17607	20	1	20	1	What do the references (to the right of the figure) refer to? [, Sweden]	Figure SPM6 was removed from the SPM
20839	20	1	20	1	It is not immediately obvious that the lower part of the figure correspond to a more detailed breakdown of the supply side measures in the top half. It would therefore be helpful to combine the two by putting the individual measures underneath the 'land use change', 'carbon sink enhancement' and 'agriculture' headings in the top half. This will also help to illustrate that these emissions reductions are not additive. [, United Kingdom (of Great Britain and Northern Ireland)]	Figure SPM6 was removed from the SPM
20841	20	1	20	1	Very useful but not the clearest figure. SPM7 is much clearer in showing mitigation potential. [, United Kingdom (of Great Britain and Northern Ireland)]	Figure SPM6 was removed from the SPM
6131	20	1	20	1	Please, try to improve the resolution of the Figure SPM 6 for better readability [Jacques-Andre Ndione, Senegal]	Figure SPM6 was removed from the SPM
8755	20	1	20	1	Not clear howt a "shift to healthy diet" is defined. Much of the literature compares the mitigation potential for plant and meat based diets. Does the shift to a healthy diet mean a shift to a more plant based diet? [Jean-Luc Chotte, France]	Figure SPM6 was removed from the SPM
8595	20	1	20	1	This figure refers to a paper that is (to my knowkdge) presently not published... This questions its relevance. [Marc Aubinet, Belgium]	Figure SPM6 was removed from the SPM

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
8597	20	1	20	1	As a collateral damage, the references on which the numbers are based are not available. It is thus impossible to check their origin. [Marc Aubinet, Belgium]	Figure SPM6 was removed from the SPM
8599	20	1	20	1	The figure gives mitigation potential but do specify neither how much time it is necessary for the measure to become efficient not for how much time they could remain efficient ? As an exemple for reforestation : "the effectiveness of using this land as a long-term carbon sink will be contingent on its ability to sustain a permanent carbon sink. In the long term, the ability of forests to sequester carbon declines with age." (Baldocchi and Penuelas 2018, Glob Chang Biol. 2018 Dec 27. doi: 10.1111/gcb.14559.) [Marc Aubinet, Belgium]	Figure SPM6 was removed from the SPM
8601	20	1	20	1	Changing livestock diets to mitigate enteric methane emissions has been proven to be effective in reducing CH4 but raises many problems, notably of toxicity (see comment Ch2 P97 L39 above). [Marc Aubinet, Belgium]	Figure SPM6 was removed from the SPM
15153	20	1	20	1	Fantastic diagram - clearly shows relative scale of mitigation options. Please retain. [Maya Hunt, New Zealand]	Figure SPM6 was removed from the SPM
25271	20	1	20	1	This figure (Fig SPM 6) gives very important information. The foot note may be made more explicit. [Naresh Kumar Soora, India]	Figure SPM6 was removed from the SPM
12929	20	1	20	1	Fig SPM 6. The use of CO2-e in this figure will have assumed specific conversion factors for methane and N2O. There is no agreement in the literature (e.g. AR5 WG 1 section 8.7) as to the appropriate conversion factors. The range of possible CO2 conversion factors needs to be made explicit (this is 4 to 84 for methane in AR5 table 8.7) or the different GHGs need to be reported separately. [William Collins, United Kingdom (of Great Britain and Northern Ireland)]	Figure SPM6 was removed from the SPM
32391	20	1	20	2	Assumptions about the positive carbon benefits of wood-based products often fail to recognize realistic counterfactual scenarios and the negative impact such replacement might have on other climate change mitigation measures like increased efficiency in the construction, furniture and packaging sectors. More in general, the contribution of harvested wood products is highly disputed, see for example Keith et al., 2015 and Law et al., 2018. [Simone Lovera-Bilderbeek, Paraguay]	Figure SPM6 was removed from the SPM
6805	20	1	20	7	The "reference" in Figure SPM 6 should be given. [Changke Wang, China]	Figure SPM6 was removed from the SPM
14579	20	1	20	7	Figure SPM.6. Genetic measures should be included. [, Canada]	Figure SPM6 was removed from the SPM
14581	20	1	20	7	Figure SPM.6. Under 'Supply side measures' -> 'Land Use Change' shouldn't 'Deforestation + wetlands + savannas' be replaced with 'Preservation of forests + wetlands + savannas' or similar. Deforestation is not a climate mitigation response option. [, Canada]	Figure SPM6 was removed from the SPM

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
27667	20	1	20	7	<p>Figure SPM.6: We appreciate the overview on technical mitigation potential of land-based mitigation options. However, the current figure is based on a single source "Roe et al." (reference in chapter 2 needs completion), provides a too many details for the SPM and lacks an assessment of the confidence in the findings. For the purpose of the IPCC and even more so for the SPM we strongly suggest some improvements:</p> <ul style="list-style-type: none"> - Please use an extended version of Table ES 2.1 which summarizes the findings of Figure SPM.6 (figure 2.32) in an aggregated way and provides confidence levels. The current Table ES 2.1 should be linked to the information in Table SPM1. - Please define "mitigation potentials": does this refer back to the AR4? What other potentials beyond the "technical mitigation potential" would exist? Please include this definition in the glossary. - Please distinguish where possible how much of mitigation potential is reduced emissions and how much is CDR. (It is highly policy relevant to know how much removal potential there is from certain measures). - "Demand Side Measures": please add an extra line for changes in consumption of meat and animal products. Please do not mix it or name it "healthy diets", because this is misleading (for some people a pure animal protein diet might seem healthy). - What is "Carbon Sink Enhancement"? If this is CDR, then please name it and do not introduce a new formulation in an SPM-figure. - "reduce conversion, draining, burning of peatlands": (potential) effects appear to be underestimated, please check. - The references referred to by numbers in the last column of the figure are not provided in the SPM. Please omit this column and give the reference to figure 2.32 on page 95 of chapter 2 in the caption of the figure instead. In the current draft however, figure 2.32 also lacks the references. [, Germany] 	Figure SPM6 was removed from the SPM
24679	20	1	20	7	Figure has interesting information but is not well presented - could be made clearer e.g. on how the tow pards are related [, Ireland]	Figure SPM6 was removed from the SPM
33921	20	1	20	7	In figure SPM6, please consider to add a numerical value to the median points. [, Norway]	Figure SPM6 was removed from the SPM
33923	20	1	20	7	In figure SPM6, please consider to remove the column "references", to increase readability [, Norway]	Figure SPM6 was removed from the SPM
3945	20	1	20	7	As the "technical potential" is not defined in the current Glossary, the reader may imagine that this is e.g. the maximum GHG mitigation that a response option may yield. Could it be possible to provide a realistic view of how much of this "technical potential" (or "ideal potential") is finally realized, after taking into account economic, regulatory, market and cultural barriers? [, Switzerland]	Figure SPM6 was removed from the SPM
20837	20	1	20	7	The caption here could be more descriptive here to give a simpler indication of what is being shown - for example, explaining what is meant by 'technical potential' by saying "This figure shows the maximum greenhouse gas emissions reductions that could be achieved by implementing land-based mitigation response options to their greatest possible extent. [, United Kingdom (of Great Britain and Northern Ireland)]	Figure SPM6 was removed from the SPM

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
38355	20	1	20	7	Does it not include institutional, governance, economic, social factors? If not, clarify and, if available, provide information regarding these factors as well. Policymakers will need to know the effect of sustainability, cost considerations, socio- economic, and climate change impact factors on policy options. Clarify which evaluations of "technical potential" include sustainability and cost considerations and which do not. If available, provide qualitative information or information gaps regarding the factors not included in the assessment of "technical feasibility." [, United States of America]	Figure SPM6 was removed from the SPM
38357	20	1	20	7	Define the lines and dots (ranges and medians?). "CO2e" is undefined and does not match usage of "CO2eq" elsewhere. [, United States of America]	Figure SPM6 was removed from the SPM
29259	20	1	20	7	Fig SPM 6: I suggest avoiding using aggregated emissions. Much better to give information by gas. Aggregating two so fundamentally different gases as CO2 and CH4 is highly problematic. And you do not even state which GWPs you have used for this. [Jan Fuglestvedt, Norway]	Figure SPM6 was removed from the SPM
29937	20	2	20	2	Which year are these potentials given for? The current technical potential of BECCS is not yet up the level given here. Please add. [, Estonia]	Figure SPM6 was removed from the SPM
14513	20	2	20	6	It will be quite dangerous if readers simply recognize from the estimation in above figure that conceptual estimation of BECCS may compensate almost half of present emission. So, this explanation from line 2-6 should be more explicitly and strongly stressed here or in the text. [Shuzo Nishioka, Japan]	Figure SPM6 was removed from the SPM
24435	20	2	20	7	SPM.6 - line on forest management: is the estimate solely related to human interventions to enhance sinks, as per the IPCC definition of mitigation? [, Belgium]	Figure SPM6 was removed from the SPM
33095	20	2	20	7	Figure SPM.6 : - there seems to be missing information on context, in particular regarding timeframes : for how long can a given sink be sustained and/or for when is the data valid. For example, Ch 2 suggests that for forest management this precise range is a 2030 estimate. - there seems to be a double counting : the substitution of cement and steel in the demand side measure relates to the same carbon as the one which is absorbed following forest management (harvesting to obtain those substitution products). This is not the same as the caveat included in the caption about competition for resources that can be used by different mitigation measures. Double counting would mean that the same potential is reported twice in the figure, with different names for the same change in practices. [Philippe Marbaix, Belgium]	Figure SPM6 was removed from the SPM

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
33097	20	2	20	7	Figure SPM.6 : - I have the impression that the line on "forest management" does not relate to something that can be called "mitigation potential". Mitigation relate to a net increase in sink or reduction of source of GHG. Do these estimates include the release of CO2 from harvested products ? It seems to solely relate to the forestry aspect, considering every sink in that sector as a net sink. Mitigation would imply that the CO2 is stored somewhere outside the atmosphere in the long term. Chapter 2 and 4 indicate that there is a tradeoff between forest sinks and stocks, thus implying that more harversting (management) does not increase the stock in the forest itself. Therefore, if this graphic reports a net sink from management, it seems to ignore the fate of the carbon that resides in the harvested wood (in particular, wood used for energy needs a specific calculation taking into account its energy content and the related amount of avoided fossil emission, which is not the same amount as the CO2 absorbed by forest regrowth). If carbon from harvested products is not included in the calculation, then I do not think that it can be referred to as a "mitigation potential". [Philippe Marbaix, Belgium]	Figure SPM6 was removed from the SPM
23791	20	3	20	6	This figure (Fig SPM 6) gives very important information. The explanation for the figure may be made more explicit. [, India]	Figure SPM6 was removed from the SPM
7737	20	3	20	6	It is necessary to add the explanation that lower panel is detailed expansion of SUPPLY SIDE MEASURE in upper panel, if so. [Hiroaki Kondo, Japan]	Figure SPM6 was removed from the SPM
4933	20	4	20	6	In the Figure SPM 6's legend, it is noted that "While some estimates of technical potential include sustainability and cost considerations, (...)". It is desirable to specifically indicate which figures (numbers) are considering sustainability and cost. [, Japan]	Figure SPM6 was removed from the SPM
5325	20	4	20	6	Figure SPM 6: figure caption: This figure caption includes very relevant information with respect to estimates of technical potential of land-based climate mitigation response options. Most of those estimates do not include socio-economic barriers, the impacts of future climate change or non-GHG climate forcing. This information should become part of a separate paragraph which should also inform about a key finding highlighted in the executive summary of chapter 1: decision makers are faced with the task of developing and implementing climate policies informed in part by incomplete information, with unknowns and uncertainty to varying degree. Advances in futures analysis and modelling that better account for full environmental costs and non-monetary values in human behavioural processes would provide a more complete knowledge base for decision making. It is suggested to include such information at the end of section B of the SPM. [Klaus Radunsky, Austria]	Figure SPM6 was removed from the SPM
38359	20	6	20	6	What is non-GHG forcing in this context: aerosol forcing, other radiative forcing? [, United States of America]	Figure SPM6 was removed from the SPM
29261	20	6	20	6	What is meant by "non-GHG climate forcing" here? [Jan Fuglestedt, Norway]	Figure SPM6 was removed from the SPM
23043	20		20		What healthy diets stands for in such a context? Further explanation of healthy diet is indicated further on page 22. [Anastasios Kentarchos, Belgium]	Figure SPM6 was removed from the SPM
23045	20		20		In this case, references at this page refer to what kind of reference? [Anastasios Kentarchos, Belgium]	Figure SPM6 was removed from the SPM

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1393	20		20		Mitigation potential cannot be simply averaged across independent studies. Round symbols indicate, probably, means, which have no any sense, since studies have different methods, locations, durations, study designs and so on. These methodological differences obviously determine the variation in results. This figure must be presented as values (dots) for each study or ranges, but no means. [Elena Valkama, Finland]	Figure SPM6 was removed from the SPM
4935	20		20		We would suggest clarifying why the upper group (Demand Side Measures, Supply Side Measures) and lower group (Land use change, Carbon sink management, and Agriculture measures) are separately explained. [, Japan]	Figure SPM6 was removed from the SPM
7739	20		20		There are many reference numbers in Fig.SPM 6, but will these references be shown in SPM? [Hiroaki Kondo, Japan]	Figure SPM6 was removed from the SPM
7661	20		20		Figure SPM 6 has missed the opportunity to add in demand side measures those that would provide incentives to stop logging natural forests further as a risk reduction measure. Substitutes for those land use activities such as strategic roads, palm oil for feedstock, mining in natural forest areas for example could all be useful tools to mitigate GHG emissions. The Figure is opaque about these aspects. These should be added. [Judy Lawrence, New Zealand]	Figure SPM6 was removed from the SPM
17411	20		20		Table caption needs to clarify year or period in/by which the annual mitigation capacity can be realized [Taehyun Park, Republic of Korea]	Figure SPM6 was removed from the SPM
17413	20		20		Figure SPM 6 - there is reference numbers given, but it is unclear what those numbers correspond to. [Taehyun Park, Republic of Korea]	Figure SPM6 was removed from the SPM
40403	20		20		Attention : blue carbon potential is also covered in SROCC. Coordination is needed to avoid inconsistencies. Traceability of the figure to the assessed literature needs to be supplied in underlying chapter. [Valerie Masson-Delmotte, France]	Figure SPM6 was removed from the SPM
24433	20	1			This figure refers to a paper that is (to our knowledge) presently not published. We do not know the references to papers that are represented by the numbers on the right. We ask for caution regarding this figure, for which a large number of hypotheses are needed. It could be an important figure if it is safe in terms of scientific data, but it should not be included in the SPM if the confidence is not high. Some Belgian experts have doubts about the quantitative details of this figure. [, Belgium]	Figure SPM6 was removed from the SPM

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
25957	20	1			We believe that this figure is relevant and justified, but we consider that it is currently subject to several defects: <ul style="list-style-type: none"> • We suggest producing a new figure based on the findings of the SRCCL rather than using an existing figure from an isolated scientific article. • We suggest to improve consistency between Figure SPM-6 page SPM-20 (also Figure 2.32 page 2-95) and Figure SPM-7 page SPM-23 (also Figure 5.14 page 5-69) and to clarify the information you wish to provide with these figures. Considered together, these figures are currently very confusing. • As a consequence of this copy and paste, neither in the report, nor in the SPM are given the details of what the references in the right column refer to. This situation should be corrected either by adding in the report the detail of the practices behind each proposed measure; or by deleting these numbers and providing a brief detail, with a clear reference to where in the report detail is find; or by explaining in the caption where the references numbers in the right column could be found. This is all the more important because the policy makers who would use this report, would need to have the IPCC findings without any confusion on the meaning behind "cropland management", "pasture management", "rice", enteric fermentation" and all other agricultural measures. • We suggest to use "mitigation options" instead of "mitigation response options" in order to avoid a confusion with the term "response measures" used in the climate negotiations. • We suggest checking the occurrence of the BECCS, currently quoted both in supply side measures and in land use change, leading to uncertainty in the accounting of potentials. • We suggest to explicitly write that the lines under land-use change, carbon sink enhancement and agricultural measures are a disaggregation of the lines under demand side and supply side demand, if it's really the case. • The list of options under the item "Land use change / Supply side measures" is not consistent: deforestation is a human action while wetlands and savannah are land types. We suggest to split and clarify this list as it is under the item "Land use change, carbon sink enhancement...". • We suggest to put "Cleaner cookstoves" under the item "Demand side measures". • See GENERAL COMMENT ON BIOCHAR. See also GENERAL COMMENT ON FIGURES. [, France] 	Figure SPM6 was removed from the SPM
20843	20	1			This is a very useful diagram. However it could be improved by including a bit of explanation of what is meant by the mitigation options (and potentially some of the main assumptions). For example, what is meant by "synthetic fertilizer production"? - Do you mean reduced use, better manufacturing techniques, better timing of application or something else? Perhaps an additional column or additional table elsewhere describing the primary adaptation and mitigation options would be useful. This could also include how widespread/in which geographies these methods are being applied at the current time. [, United Kingdom (of Great Britain and Northern Ireland)]	Figure SPM6 was removed from the SPM
15907	20	2			Very skeptikal about the use of this Figure.Needed to have a Warning note before indicating i) that the options can not be compared per se, because they rely on potential based on actual land use? ii) it focuses only on GtCO2 and not on the positive/negative feedbacks one option may have on ecosystem services, global circulation fluxes etc. [Caroline Vincke, Belgium]	Figure SPM6 was removed from the SPM
32915	20				Some options found in the literature are missing from this figure. See Dooley et al. (2018). [Doreen Stabinsky, United States of America]	Figure SPM6 was removed from the SPM
21861	20				In fig SPM6 the function of the bullets in the middle range estimates seems to point to the arithmetic average value. We suggest to delete these bullets. [, Finland]	Figure SPM6 was removed from the SPM

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13449	20				What do the numerical values across the different measures represent? [Lourdes Tibig, Philippines]	Figure SPM6 was removed from the SPM
17337	20				Fig SPM 6 is missing references to "Supply side measures". All the other aspects have cited references except this one. [Maria Helena Cruz de Carvalho, France]	Figure SPM6 was removed from the SPM
17813	20				SPM 6 is a useful figure. It would also be helpful to see where the ranges of sustainable potentials have been assessed (e.g. the potentials assessed in SR1.5 for BECCS and A/R) [Quentin Lejeune, Germany]	Figure SPM6 was removed from the SPM
33925	21	1	21	1	Use "A large-scale deployment" rather than "The large-scale deployment" as the latter sounds like it has been decided to deploy. [, Norway]	Noted
3037	21	1	21	1	'land-intensive': definition is needed (once again, Glossary is needed) [, Russian Federation]	Noted. Reference to glossary terms added where appropriate
29263	21	1	21	1	I suggest you delete "The" and start with "Large-scale.." [Jan Fuglestvedt, Norway]	Noted
8757	21	1	21	6	The text in B4 doesn't align well with SPM 6 which may result in overall confusion. B4 states that biochar, BECCS, etc. will increase pressure on land but then SPM 6 shows a high mitigation potential. [Jean-Luc Chotte, France]	Figure SPM6 was removed from the SPM
8857	21	1	21	6	while application of large scale CDR options could place pressure on land with cascading effects, application of LDN principles removes such limitations [Jean-Luc Chotte, France]	Noted. LDN addressed in SPM Section B and C
12987	21	1	21	7	I do not agree that afforestation or reforestation jeopardise access to water- is this what you intended to communicate? Similarly, elsewhere in the report biochar is said to lead to improved water-holding capacity, does it also jeopardise access to water? [Aidan Farrell, Trinidad and Tobago]	Statement has been substantially rewritten and revised in response to reviewer comments (see new B5)
23047	21	1	21	7	Statement B4 needs a clarification or caveat to explain that there are other important pressures on land. CDR options do not add pressure against a 'neutral' backdrop. For example, section B already mentions the contribution of meat consumption and the extensive pasture. Also, add 'can': "..., that can conflict with..." [Anastasios Kentarchos, Belgium]	Statement has been substantially rewritten and revised in response to reviewer comments (see new B5)
23049	21	1	21	7	Consider simplifying B4 title. Key points are that large-scale deployment of CDR options [examples] is needed, but some options [examples] are expected to increase pressure on land. [Anastasios Kentarchos, Belgium]	Partially accepted. HS revised
15257	21	1	21	7	"large scale deployment" needs to be more clearly defined. Where are the boundaries between effective CDR options that lead to positive outcomes and those that could cause the potentially negative impacts that are detailed here? How much surplus biomass is currently available to enable BECCS without establishing new energy crop plantations? How much degraded land is available for afforestation or reforestation without conflicting with other SDGs? There is potential for large scale expansion of industrial biomass utilisation from existing feedstock surplus and availability, without the need for additional land and energy crops (see UK government data https://www.gov.uk/government/publications/uk-and-global-bioenergy-resource-model). [Andrew Dugan, United Kingdom (of Great Britain and Northern Ireland)]	Statement has been substantially rewritten and revised in response to reviewer comments (see new B5)
32917	21	1	21	7	Humanity has options, and it is rather important to use language that makes us think there are options. IF large-scale deployment of options such as BECCS, etc. THERE WOULD BE. Use conditional language rather than language that causes one to think that BECCS is our only answer. [Doreen Stabinsky, United States of America]	Statement has been substantially rewritten and revised in response to reviewer comments (see new B5)

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
31577	21	1	21	7	Change language from "conflict with other objectives" to "interact with other objectives..." in lines 3 and 4. Plus, delete the phrase "jeopardising achievement of other sustainable development goals (SDGs), including access to water". Add at the end of that sentence "and access to water, requiring careful management and understanding of tradeoffs". Complete sentence should read: "The large-scale deployment of land-intensive carbon dioxide removal (CDR) options— bioenergy with carbon capture and storage (BECCS), afforestation and reforestation and biochar—are expected to increase pressure on land leading to trade-offs and cascading effects, that interact with other objectives such as environmental sustainability, food security and access to water, requiring careful management, maximization of positive synergies, avoidance of strong negative impacts, and awareness of tradeoffs". Justification: the negative language in the SPM does not reflect the carefully phrased references in the IPCC draft report cited in lines 6 and 7. They all call for management of tradeoff, and mention both positive and negative impacts on other goals, depending on context, prior conditions, and specific implementation. (D.4.3 of IPCC 1.5) [, Brazil]	Statement has been substantially rewritten and revised in response to reviewer comments (see new B5)
25959	21	1	21	7	We suggest to be more nuanced in this statement on CDRs and their impacts in terms of sustainability, currently too negative, in an unfounded way. In particular, some CDR activities, such as nature-based solutions can generate significant cobenefits for other SDGs such as biodiversity and food security. As highlighted in section 4.7.3 pages 4-40 to 4-41, in some cases, such as degraded lands, afforestation and reforestation improve soil quality and food security, thereby contributing to the SDGs. Same for organic waste recycling (e.g. manure, composts), mentioned in chapter 2 and 4, that allows to improve soil fertility and soil organic matter and generates strong cobenefits on food security. Although the SRCL is an opportunity to further develop the findings of SR15, this latter properly captured the fact that some land-based options endanger sustainable development, while some other can contribute to it. An effort should be made to ensure consistency between the two reports, or at a minimum, changes in the message between the two should be well justified and explained. See GENERAL COMMENT ON CDR AND SUSTAINABILITY. See GENERAL COMMENT ON NATURE-BASED SOLUTIONS. [, France]	Statement has been substantially rewritten and revised in response to reviewer comments (see new B5). Synergies and co-benefits in separate bullet (B6)
25965	21	1	21	7	In order to include agriculture in the solutions to reflect §B4.3, and to separate the CDR that lead to pressure and those who don't, we propose as a title : "The large-scale deployment of carbon dioxide removal (CDR) options, like revegetation including agroforestry on agriculture land, like reforestation, is needed. Some land intensive options— bioenergy with carbon capture and storage (BECCS), afforestation and biochar— are expected to increase pressure on land ... [, France]	Partially accepted. HS revised

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
30115	21	1	21	7	Statement B4 only focuses on the negative impact of NETS, in particular BECCS, bioenergy and biochar. However, there are many examples in the underlying report of statements that imply positive impacts also, especially when degraded or marginal lands are used. For example "CDRs require high biomass-producing crops. Since not all plant biomass is harvested (e.g., roots and harvesting losses), it can produce co-benefits related to soil carbon sequestration, depending on previous use of the soil and its management, and also improvements in air quality." see page 5-77, lines 20-22. Also it is indicated that negative impacts are very uncertain, especially with respect to iLUC: "Estimates of emissions from indirect land use change are inherently uncertain and highly dependent on modelling assumptions, such as supply/demand elasticities, productivity estimates, incorporation or exclusion of emission credits for coproducts, and are widely debated in the scientific community." see page 2-103, lines 6-8. [, Netherlands]	Statement has been substantially rewritten and revised in response to reviewer comments (see new B5). Synergies and co-benefits in separate bullet (B6)
30117	21	1	21	7	It would be worth considering to add a statement on the necessity of NETs to achieve C-neutrality by the end of the century, which was also a clear message from SR1.5. For example, as summarized in chapter 2, page 7, lines 1 to 7. Or page 2-93, lines 33-35: "As some sector emission are hard to eliminate entirely (e.g., air transport, food production) this implies an ongoing need for options that result in a net removal of GHGs from the atmosphere and storage in living or dead plant material, soils, or in geological stores". [, Netherlands]	Statement has been substantially rewritten and revised in response to reviewer comments (see new B5). Role of CDR in mitigation pathways addressed in B7
30119	21	1	21	7	If statement B4 remains unchanged, references to section 2.6 and 2.7 should be deleted since these sections do NOT deal with food security, SDGs, bioenergy and/or BECCS. [, Netherlands]	Accepted, thanks
30121	21	1	21	7	Also delete the references to sections 4.7.1, 4.7.2, 4.7.3, 4.7.6, since they do NOT deal with bioenergy, BECCS, SDGs or food security. These section are on the impacts of bioenergy on land degradation. That could be covered by an additional statement. [, Netherlands]	Accepted, thanks
29647	21	1	21	7	This head statement is not a balanced view of the problem as it omits the big potential contribution of land-based mitigation to achieve the Paris Agreement. Currently it only lists its problematic aspects. The conclusions from B4.1 and B4.2 should also be reflected in B4. The language also currently implies that negative impacts are inevitable, rather than that trade-offs could "potentially" happen and that conflicts "could" arise unless adequately managed. [, Saint Lucia]	HS revised
30939	21	1	21	7	Strongly agree that BECCS and large-scale afforestation conflict with aims around food security and sustainability. This statement should be given greater visibility and allowed to lead to the conclusion, as it does and should, that expanding the global bioenergy industry is not a sustainable way forward - we need to reduce, not increase, the demand for land, and protect the forests and ecosystems that we already have. [Kelsey Perlman, France]	Statement has been substantially rewritten and revised in response to reviewer comments (see new B5)
6867	21	1	21	7	Here finally these important statements are made, but this needs to be reflected throughout the SPM. [Markus Giger, Switzerland]	Noted, thank you for the positive comment
22107	21	1	21	7	B4-Please address: Growing and producing 2nd generation bioenergy plants for BECCS on vast tract of land for land-based mitigation option is really challenging. It will have negative consequences on soil carbon stock and global climate change. Fresh water resources will face drastic scarcity for maintaing such huge bioenergy stock. Also if huge tract of land is utilized for BECCS, then land for agricultural production will be compromised and food security will be at stake. [Suvadip Neogi, India]	Statement has been substantially rewritten and revised in response to reviewer comments (see new B5)

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
20847	21	1	21	8	The phrase "land-based mitigation" is first used in row 8 but has not been defined. ("Land based climate change mitigation measures" are mentioned in rows 23-24 of page 3 but they're not defined either; this phrase is only used once.) Rows 1-2 may be attempting to do this but it's not clear. A definition of "land based mitigation" should be added to the glossary and used consistently throughout the report. It needs to be clear whether it refers just to CDRs or includes mitigation measures which are not CDRs. We've made the same comment against ch.5. [, United Kingdom (of Great Britain and Northern Ireland)]	Harmonised throughout SPM
8875	21	1	21	14	A critical category is missing, but which is elsewhere in the document, including Chap 6. Suggest before the mentions of "biochar" to insert "conservation agriculture" [Jean-Luc Chotte, France]	Statement has been substantially rewritten and revised in response to reviewer comments (see new B5)
33981	21	1	21	25	This critical section is to be revised substantially. It lacks clarity of the issues, most of all quantifications and needs to be enhanced. Make sure this text is also fully consistent with SR1.5. [Andreas Fischlin, Switzerland]	Statement has been substantially rewritten and revised in response to reviewer comments
7489	21	1	21	25	Add into §B4 that BECCS is not carbon neutral in the critical near-term. See 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."). See, also Duncan Brack, Wood Is Not a Carbon-Neutral Energy Source (1 March 2017). [Durwood Zaelke, United States of America]	Statement has been substantially rewritten and revised in response to reviewer comments (see new B5)
7491	21	1	21	25	Using BECCS to draw down the between 2 and 10 Gt CO2 annually that is mentioned in IAM reports would require the dedication of land equivalent to the size of India, or even twice this amount. See Anderson K. & Peters G. (2016) The trouble with negative emissions, Science 354:182–183, 183. Land requirements for BECCS could accelerate loss of forest and grassland, leading to more species loss than scenarios without BECCS. See Williamson, P., Emissions reduction: Scrutinize CO2 removal methods (Nature Comment, 10 February 2016). Large-scale BECCS could put significant strains on global freshwater use, land-system change, biosphere integrity, and biogeochemical flows. Vera Heck et al., Biomass-based negative emissions difficult to reconcile with planetary boundaries, Nature Climate Change (2018). [Durwood Zaelke, United States of America]	Statement has been substantially rewritten and revised in response to reviewer comments (see new B5)

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
30223	21	1	21	25	As commented on in chapter 5, page 101, bioenergy use is not dependent on BECCS. Bioenergy use can be as high or higher when BECCS is excluded (statement C3.2 in SPM of SR 1.5). The role of bioenergy should therefore also be discussed independently of BECCS. [, Netherlands]	Statement has been substantially rewritten and revised in response to reviewer comments
33927	21	1	21	25	Please consider to introduce into SPM B4. a para about short-lived GHGs. Information from 2.7.1.2 (2-97, line 32-44) could be policy relevant: "agriculture accounts for 56% of methane emissions, and 27% of all potent short-lived gases (Sections 2.4 and 2.5), measures addressing enteric fermentation, manure management and rice CH4 emissions have strong potential to reduce global warming effects in the short-term throughout many regions" [, Norway]	Statement has been substantially rewritten and revised in response to reviewer comments
20845	21	1	21	25	The text 'Land sector carbon dioxide removal, while not a substitute for strong action in the energy sector, has the technical potential to balance unavoidable emissions, with early action avoiding deeper and more rapid action later' (chapter 2, p2-7, lines 43-45) conveys a key message justifying the need for early action which would benefit from inclusion underneath B4. [, United Kingdom (of Great Britain and Northern Ireland)]	Statement has been substantially rewritten and revised in response to reviewer comments (see new B5). Role of CDR in mitigation pathways addressed in B7
17415	21	1	21	25	The summary on BECCS is very short in the SPM and misses to discuss more in detail the previous statement (page18, line 13-14) that available high carbons stock areas (incl. grassland/savannahs) provide bigger mitigation benefits when protected, compared to when used for bioenergy crops [Taehyun Park, Republic of Korea]	Statement has been substantially rewritten and revised in response to reviewer comments (see new B5)
25961	21	2	21	2	Instead of, or in addition to biochar, we suggest to consider organic waste recycling (e.g. manure, composts), mentioned in chapter 2 and 4. Recycling of organic waste allows to improve soil fertility and soil organic matter and generates strong cobenefits in mitigation, adaptation, land degradation and food security. See GENERAL COMMENT ON BIOCHAR. [, France]	Statement has been substantially rewritten and revised in response to reviewer comments
25963	21	2	21	2	We suggest to differentiate nature-based solutions and technology-based solutions in land-based CDR. Assessment of SDG trade-offs and cobenefits should be better detailed according to each option. See GENERAL COMMENT ON NATURE-BASED SOLUTIONS. [, France]	Statement has been substantially rewritten and revised in response to reviewer comments
16469	21	2	21	2	Biochar is not impotent factors comparing with mass of other factors in the world yet even though it has function of CDR. So it's better to eliminate. [, Republic of Korea]	Statement has been substantially rewritten and revised in response to reviewer comments
30113	21	3	21	3	Please add "if managed inappropriately" after "cascading effects". Then start a new sentence "This could conflict...". This would better reflect the point that CDRs do not necessarily have negative effects. [, Netherlands]	Statement has been substantially rewritten and revised in response to reviewer comments
30399	21	3	21	3	B4: please add 'increased risks' before 'to trade-offs'. It is a matter for policy makers to design good ways of governance to navigate as good as possible around the barriers that the choice for a pathway implies. [, Netherlands]	Statement has been substantially rewritten and revised in response to reviewer comments
20849	21	3	21	3	replace "are expected" with "would lead"; it's a more objective statement. [, United Kingdom (of Great Britain and Northern Ireland)]	Statement has been substantially rewritten and revised in response to reviewer comments
14583	21	4	21	4	Replace 'trade-offs and cascading effects' with 'negative and cascading effects'. A 'trade off' is a balance between two desirable but mutually incompatible aims. The meaning here is simply 'negative effects'. [, Canada]	Statement has been substantially rewritten and revised in response to reviewer comments
21793	21	4	21	7	"biodiversity" could be added to this list as it is something distinctly different from environmental sustainability [Graham von Maltitz, South Africa]	Statement has been substantially rewritten and revised in response to reviewer comments
15531	21	5	21	5	Change "achievement" to "achievements". [Annika Herbert, South Africa]	Statement has been substantially rewritten and revised in response to reviewer comments
3947	21	5	21	5	Write: "... access to water and biodiversity and ecosystems conservation (high confidence)." [, Switzerland]	Statement has been substantially rewritten and revised in response to reviewer comments

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
17423	21	5	21	5	Bioenergy expansion will jeopardize the achievement of biodiversity targets too, especially relevant in the current mass extinction. E.g. "including access to water or biodiversity" could be added to this paragraph. [Taehyun Park, Republic of Korea]	Statement has been substantially rewritten and revised in response to reviewer comments
8801	21	8	21	8	Include climate change: It should read "Land-based climate change mitigation ..." [Jean-Luc Chotte, France]	Harmonised throughout SPM
5327	21	8	21	8	The sentence: Land-based mitigation could provide around a third of the near term 2030 to 2050 mitigation potential is too policy prescriptive. Given the limitations of scenarios (see the comment above) as well as the associated pressure on food security this contribution might be much too high - and it will strongly depend on the SSR along which the world will develop. The following language is suggested: Land-based mitigation could provide a significant contribution to the near term 2030 to 2050 mitigation required to meet the Paris Agreement temperature goal. [Klaus Radunsky, Austria]	Statement has been substantially rewritten and revised in response to reviewer comments
8603	21	8	21	8	How is this number obtained ? Appears quite arbitrary. [Marc Aubinet, Belgium]	Statement has been substantially rewritten and revised in response to reviewer comments
24437	21	8	21	9	We wonder how this number is obtained. What is the level of evidence and agreements ? In view of the preceding comments, as some measures impacts appear optimistic, so appears the global sum. What is meant by "the long term temperature goal of the Paris agreement" (is it well below 2°C or 1.5°C) ? [, Belgium]	Statement has been substantially rewritten and revised in response to reviewer comments
20855	21	8	21	9	Can it be clarified what this statement is based on? It is a quote from Section 2.7.3 (Ch.2 p.111 rows 29-10), where it is accompanied by "(medium evidence, high agreement)". But the SPM states the sources also include section 2.7.1. If this statement is based on all the literature described in section 2.7.1, it will need to be revised after our comment on ch.2 p.95-96 row 8 has been addressed. We'd prefer a statement based on critical appraisal of literature which takes into account real-world constraints. [, United Kingdom (of Great Britain and Northern Ireland)]	Statement has been substantially rewritten and revised in response to reviewer comments
38361	21	8	21	9	The Paris Agreement does not have requirements associated with its goals. Removal of the word "requires" in this sentence would make it accurate with respect to the Paris Agreement. [, United States of America]	Statement has been substantially rewritten and revised in response to reviewer comments
17419	21	8	21	9	It could be understood here that "near term" refers to 2030-2050 which is quite confusing, given that 2050 is usually considered a long-term goalpost. Please reserve the "near term" expression for the period between now and 2030, which will also make it more relevant for the topical considerations on revising 2030 targets. [Taehyun Park, Republic of Korea]	Definition of near-term and long-term harmonised throughout SPM
14515	21	8	21	10	It will be quite dangerous if readers simply recognize from the estimation in above figure that conceptual estimation of BECCS may compensate almost half of present emission. So, this explanation from line 2-6 should be more explicitly and strongly stressed here or in the text. [Shuzo Nishioka, Japan]	Statement has been substantially rewritten and revised in response to reviewer comments
30239	21	8	21	11	What is one third in terms of total C or CO2 eq? [, Netherlands]	Statement has been substantially rewritten and revised in response to reviewer comments
33929	21	8	21	11	If this is referring to a technical potential this should be clarified. [, Norway]	Statement has been substantially rewritten and revised in response to reviewer comments
33931	21	8	21	11	B4.1. Please consider associating with historical rate of land use change and it should be moved earlier in the SPM. [, Norway]	Statement has been substantially rewritten and revised in response to reviewer comments

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
33933	21	8	21	11	Please consider to include information from 4.7.1 (4-39, line 33 to 37): "The requirement for NETs varies widely between different scenarios for meeting the targets of the Paris Agreement, ranging from 450–1000 GtCO ₂ accumulated during the 21st century for 1.5°C and 0–900 GtCO ₂ for 2°C. Estimates of the biophysical possibilities of such amounts indicate a range of 370–480 Gt CO ₂ . Even this range must be considered optimistic from a social and ethical point of view". This seems to be highly policy relevant. [, Norway]	Statement has been substantially rewritten and revised in response to reviewer comments
20851	21	8	21	11	It would be helpful to explain why the technical potential of response options is not additive - this could be addressed by adding 'due to competing demand for finite resources' at the end of B4.1 [, United Kingdom (of Great Britain and Northern Ireland)]	Statement has been substantially rewritten and revised in response to reviewer comments
20853	21	8	21	11	In B4.2, the phrase 'most modelling scenarios assume very rapid deployment of BECCS' implies that this deployment is predetermined as opposed to chosen by the models as a feature a least-cost pathway. This could be resolved by saying that 'Most modelling scenarios assume that very rapid deployment of BECCS reaching rates of (numbers) is possible' or 'Most modelling scenarios require a rapid deployment of BECCS reaching rates of (number) in order to achieve a given temperature goal'. [, United Kingdom (of Great Britain and Northern Ireland)]	Statement has been substantially rewritten and revised in response to reviewer comments
29265	21	8	21	11	The two sentences in that para could be better connected. [Jan Fuglestad, Norway]	Statement has been substantially rewritten and revised in response to reviewer comments
17815	21	8	21	11	What does it mean to say that land-based mitigation could provide "a third" of near-term mitigation? What assumptions is this based on? Is this compared with a scenario in which no land-based mitigation is used, or is it compared with a scenario in which the NDCs are fulfilled? Are there scenarios in which a quarter of near-term mitigation is achieved in the land sector, but a continuation of fossil fuels is allowed at a level that would leave stranded assets and greater challenges in the longer term? [Quentin Lejeune, Germany]	Statement has been substantially rewritten and revised in response to reviewer comments
17817	21	8	21	11	The SPM does not contain any points on biophysical impacts of CDR options, e.g. the report discusses A/R and bioenergy and their effects on local temperature, which is important context for considering different CDR options [Quentin Lejeune, Germany]	Statement has been substantially rewritten and revised in response to reviewer comments
33935	21	8	21	14	Please consider to include information from the ES2 (2-7, line 29-32: "Alternative model-based integrated pathways exist that achieve climate change targets with less need for land-demanding carbon dioxide removal (CDR). Those rely on lifestyle changes and agricultural intensification in which reduced cattle stocks play an important role, with rapid and early reduction of GHG emissions and earlier CDR in the land but also in other sectors. (robust evidence, high agreement) (2.7.2)." This statement could be seen together with information on the assessed total potential for CDR/NETs from chapter 4.7.1 (4-39, line 33-37): "The requirement for NETs varies widely between different scenarios for meeting the targets of the Paris Agreement, ranging from 450–1000 GtCO ₂ accumulated during the 21st century for 1.5°C and 0–900 GtCO ₂ for 2°C. Estimates of the biophysical possibilities of such amounts indicate a range of 370–480 Gt CO ₂ . Even this range must be considered optimistic from a social and ethical point of view". [, Norway]	Statement has been substantially rewritten and revised in response to reviewer comments
11651	21	8	21	25	IPCC certainty language is missing [Linah Ababneh, Sweden]	Uncertainty language added where appropriate
7265	21	8	21	32	An assessment of these bullet points and headline statements are required. [Debra Roberts, South Africa]	Statement has been substantially rewritten and revised in response to reviewer comments

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809	21	9	21	9	in addition to the long-term temperature goal of the Paris Agreement, the ultimate objective of the UNFCCC shall be mentioned. "required to reach the ULTIMATE OBJECTIVE OF THE CONVENTION AND THE long-term temperature goal..." [, Spain]	Statement has been substantially rewritten and revised in response to reviewer comments
38363	21	9	21	9	Use the value of the long term temperature goal of the Paris Agreement. [, United States of America]	Statement has been substantially rewritten and revised in response to reviewer comments
38365	21	9	21	11	Section B4.1 states that, "Estimates of the technical potential of individual land-based response options cannot be simply aggregated to obtain the global technical potential." This is an important point that should be retained. [, United States of America]	Noted
8859	21	9	21	11	application of LDN rather than individual land based responses enables the technical issue of obtaining a global technical potential from aggregated sum to be addressed. Please consult Orr BJ, Cowie AL, Castillo Sanchez VM, Chasek P, Crossman ND, Erlewein A, Louwagie G, Maron M, Metternicht GI, Minelli S, Tengberg AE, Walter S, Welton S (2017) Scientific conceptual framework for land degradation neutrality. A report of the science-policy interface. United Nations Convention to combat Desertification [Jean-Luc Chotte, France]	Statement has been substantially rewritten and revised in response to reviewer comments
3039	21	10	21	10	'cannot be simply aggregated': vague [, Russian Federation]	Statement has been substantially rewritten and revised in response to reviewer comments
17609	21	10	21	11	Suggest omitting the last sentence as the issue already stated in the figure caption. <u>Alternatively, reverse the order of the sentences.</u> [, Sweden]	Statement has been substantially rewritten and revised in response to reviewer comments
31579	21	12	21	12	Add a paragraph B4.2bis, reading: "Although large-scale implementation of land-based negative emission technologies (NETs) has significant potential risks, the need for negative emissions and the anticipated investments to implement such technologies can also create significant opportunities. Investments into land-based NETs can contribute to halting and reversing land degradation, to the restoration or rehabilitation of degraded and marginal land, and can contribute to the goals of land degradation neutrality. {4.7.3}" Justification: this excerpt is a very good summary of the tradeoffs and potential synergies dynamics involved in managing NETs, useful for policymakers. [, Brazil]	Statement has been substantially rewritten and revised in response to reviewer comments
38367	21	12	21	12	What is the scale of the models? Earth system? Landscape? Ecosystem? [, United States of America]	Statement has been substantially rewritten and revised in response to reviewer comments
32919	21	12	21	14	Be more clear about this: most modelling scenarios are designed with particular assumptions and parameters, and with a very limited set of possible technologies to be deployed, which lead to a very narrow set of technologies in their outputs. [Doreen Stabinsky, United States of America]	Statement has been substantially rewritten and revised in response to reviewer comments
29939	21	12	21	14	What was the precedent in 1961 and was it successful? And is this amount of land available for annual expansion? Will this increase compromise food production? [, Estonia]	Statement has been substantially rewritten and revised in response to reviewer comments
25967	21	12	21	14	We suggest to include other activities such as increasing soil carbon content on crop lands, and grassland preservation that are currently not cited, although they could deliver significant benefits in mitigation, adaptation and food security. Most IAMs do not take these options into account, which could add negative emission potential. We suggest also to include a clear recommendation that IAMs should improve the consideration of these options. [, France]	Statement has been substantially rewritten and revised in response to reviewer comments
27669	21	12	21	14	"Most modelling scenarios assume very rapid deployment of BECCS, afforestation/reforestation and biochar ..." - it would be helpful to give more detail on what these amounts mean, e.g. comparing to current global land uses, or by breaking values down for regions. [, Germany]	Statement has been substantially rewritten and revised in response to reviewer comments

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4937	21	12	21	14	This sentence is valuable but for better description, the levels of climate change mitigation assumed in the pathways would need to be clarified. [, Japan]	Statement has been substantially rewritten and revised in response to reviewer comments
29649	21	12	21	14	In most scenarios there is substantial bioenergy deployment, not just BECCS. Could the whole range of land-use expansion rates be included here, not only the upper level? [, Saint Lucia]	Statement has been substantially rewritten and revised in response to reviewer comments
20857	21	12	21	14	This sentence should be replaced with one stating what are credible assumptions in scenarios, to match requesting re-write in chapter 5, p.77, rows 26-34. [, United Kingdom (of Great Britain and Northern Ireland)]	Statement has been substantially rewritten and revised in response to reviewer comments
38369	21	12	21	14	The phrasing of this statement leaves it unclear whether there is no precedent for this rate of expansion since at least 1961 because there was a documented example before 1961, or because there is insufficient data before 1961. The sections referenced (2.7.2 and 5.6.1) do not clearly support the statement or shed light on the lack of clarity described above. If the statement can be supported by more than one study, suggest clarification and correcting the reference. [, United States of America]	Statement has been substantially rewritten and revised in response to reviewer comments
13451	21	12	21	14	If there has been no study of rate of expansion as stted, what would it mean if this projected rate happens? [Lourdes Tibig, Philippines]	Statement has been substantially rewritten and revised in response to reviewer comments
17819	21	12	21	14	How does this compare with e.g. the rate of increase in agricultural land (pasture and cropland)? It might be more useful to have the whole range of expansion rates, rather than an upper projection. How does this vary with different SSP scenarios? [Quentin Lejeune, Germany]	Statement has been substantially rewritten and revised in response to reviewer comments
17421	21	12	21	14	It would be very important to acknowledge here that modeling scenarios that exclude or limit the reliance on BECCS have a strong focus on near-term measures, innovations and sustainability which result in lower energy and land demand. (See the Pathway6 RCP1.9 in chapter 2.7.2, and the description of the same pathway in the IPCC SR15 Figure SPM.3b as the illustrative model pathway P1. See also the description of the model pathway P2 in the same figure.) [Taehyun Park, Republic of Korea]	Statement has been substantially rewritten and revised in response to reviewer comments
1499	21	13	21	13	Biochar is not included in (most) IAMs and is therefore not assumed to be scaled up rapidly between 2030 and 2050 [Oliver Geden, Germany]	Statement has been substantially rewritten and revised in response to reviewer comments
40287	21	13	21	13	It is not readily understandable why biochar is being singled out with BECCS and AR as CDR measures. Most of the models in the SR 1.5 make use on these two measures and in some, Direct Carbon Capture an Storage. At a maximum, replace biochar to soil carbon sequestration. Despite the fact that biochar is included as a CDR measure in chapter 5, here we are talking about the inclusion of these measures in the pathways that limit global warming. [Thelma Krug, Brazil]	Statement has been substantially rewritten and revised in response to reviewer comments
3949	21	14	21	14	Express areas in square km (km**2) instead in ha. The last IPCC report (SR1.5) has adopted the practice of expressing areas in square km (km**2). [, Switzerland]	Statement has been substantially rewritten and revised in response to reviewer comments
6873	21	14	21	14	Add a sentence: "Experience with afforestation and reforestation show that this can be a difficult process and so far such efforts have a mixed track record". [Markus Giger, Switzerland]	Statement has been substantially rewritten and revised in response to reviewer comments
811	21	15	21	15	we believe that the language is incorrect. Stocks don't remove carbon, ecosystems do. Therefore, we suggest deletion of Stocks from this sentence. Replace by "Most landS stocks potentially available for CDR are..." [, Spain]	Statement has been substantially rewritten and revised in response to reviewer comments
6869	21	15	21	15	Here a whole para would be needed which says clearly that an reduction of cropland area as proposed by a number of scenarios does not appear to be feasible or compatible with the requirements for food security. [Markus Giger, Switzerland]	Statement has been substantially rewritten and revised in response to reviewer comments

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
23055	21	15	21	16	<p>Replace "Most land stocks potentially available for CDR are currently classified as meadows and pastureland (estimated as 3.3 Gha globally)." with</p> <p>"Most land stocks identified by models as potentially available for afforestation and energy crops are currently classified as meadows and pastureland (estimated as 3.3 Gha globally). However, most bioenergy currently comes from forests, and some of the energy crops may also displace forests."</p> <p>This would be important, as forests are the main source of energy biomass, and it is likely to remain the case for BECCS. Models identify other land types because they are so constrained, but that does not indicate the most likely development. [Anastasios Kentarchos, Belgium]</p>	Statement has been substantially rewritten and revised in response to reviewer comments
32921	21	15	21	18	<p>People and animals are missing in this description. There is a tendency to portray grasslands and pasture as devoid of humans and communities that depend on those lands, leading to assumptions and characterizations of marginality and emptiness. Avoid this. A phrase like "low food productivity" can be used to undermine tenure and livelihoods, for example when peasant landholdings are seen as more valuable, and appropriated, for biomass production. [Doreen Stabinsky, United States of America]</p>	Statement has been substantially rewritten and revised in response to reviewer comments
23053	21	15	21	21	<p>Break paragraph into two at: "Integrated practices, ..." Keeping the two statements in one paragraph will lead to wrong conclusions, eg that CSA can improve these marginal sites. Rather than leading to intensification, this would mineralize great amounts of labile SOC and create a large C debt. In the end there are two separate issues here: i) the inherent pros & cons of CSA (compared to intensive agriculture presumably); ii) the drawbacks of converting meadowland to agriculture. What is the point of conflating them? Is it to highlight that CSA does not nullify the negative impacts of land conversion? If so, just say this. [Anastasios Kentarchos, Belgium]</p>	Statement has been substantially rewritten and revised in response to reviewer comments
6341	21	15	21	21	<p>This is an important paragraph, but currently it focuses largely on the negative aspects of CDR without mentioning potential benefits (e.g. increased resilience, productivity and crop yields from climate smart agriculture and conservation agriculture) [, Gambia]</p>	Statement has been substantially rewritten and revised in response to reviewer comments
30241	21	15	21	21	<p>Statement B4.3 is internally inconsistent. Make a clear distinction between grasslands and croplands. Change "low average food crop productivity" in line 18 into "low average potential food crop productivity" if the sentence refers to grassland. Also, deforestation in line 21 should be removed in the current context (i.e. sustainable intensification which leads to less deforestation, not more). [, Netherlands]</p>	Statement has been substantially rewritten and revised in response to reviewer comments
33937	21	15	21	21	<p>Please consider to elaborate further on local considerations to land based NETs. The underlying report 4.7.3 (4-40, 4-41) states, among other things, that 1) local considerations strongly affects the effectiveness of afforestation as a NET, and the balance of synergies and trade-offs, and 2) that afforestation on marginal and degraded land will increase the area demand and unit cost of achieving negative emissions. This seems to be relevant for policymakers, as these local considerations needs to be made when designing policy to achieve large scale landbased NET-deployment. [, Norway]</p>	Statement has been substantially rewritten and revised in response to reviewer comments
813	21	15	21	21	<p>this paragraph does not include any confidence level. Either it is added or the paragraph should be deleted. [, Spain]</p>	Statement has been substantially rewritten and revised in response to reviewer comments

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20859	21	15	21	21	The key messages of B4.3 are currently unclear as phrased. This could be rephrased as 'Most land stocks potentially available for CDR are currently classified as meadows and pastureland, which currently have low average food productivity and often offer opportunities for sustainable intensification. This would increase soil carbon stocks as well as mitigate livestock emissions.' (Adapted from chapter 5, p5-77, lines 35-38). Alternatively, this section could be removed. [., United Kingdom (of Great Britain and Northern Ireland)]	Statement has been substantially rewritten and revised in response to reviewer comments
30709	21	15	21	21	This is an important paragraph, but currently it focuses largely on the negative aspects of CDR without mentioning potential benefits (e.g. increased resilience, productivity and crop yields from climate smart agriculture and conservation agriculture) [., United Republic of Tanzania]	Statement has been substantially rewritten and revised in response to reviewer comments
38371	21	15	21	21	The discussion of trade-offs in Section B4.3 is handled well. [., United States of America]	Statement has been substantially rewritten and revised in response to reviewer comments
22109	21	15	21	21	B4.3-Please check: Grasslands have excellent carbon sequestration capacity-these act as repository of carbon. Also, conservation agriculture and climate smart agriculture help conserving biodiversity and natural resources. [Suvadip Neogi, India]	Statement has been substantially rewritten and revised in response to reviewer comments
1591	21	15	21	25	Land-intensive carbon dioxide removal (CDR) – [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	Harmonised throughout SPM
1593	21	15	21	25	For grassland areas in the USA – the UK government might usefully ask local USA farmers what they can do to help if the Trump government will not do so. In Brasil, we may all need to listen to the needs of local famers there if stronger environmental regulation and governance is reduced under the new Bolsonaro government – as seems likely now. [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	Statement has been substantially rewritten and revised in response to reviewer comments
4939	21	16	21	16	Suggest stating "3,300 Mha (or million ha)" instead of "3.3 Gha" as B3 section uses Mha (or million ha) and using the same unit can give us easier understanding of its scale. [., Japan]	Statement has been substantially rewritten and revised in response to reviewer comments
3951	21	16	21	16	Express areas in square km (km**2) instead in ha. The last IPCC report (SR1.5) has adopted the practice of expressing areas in square km (km**2). [., Switzerland]	Harmonised throughout SPM
21795	21	16	21	16	"grasslands often occur in areas peripheral to intensive cropping regions" this statement is strange as it is stated in the report that most intensive cropping regions occur on areas that where one grassland. [Graham von Maltitz, South Africa]	Statement has been substantially rewritten and revised in response to reviewer comments
8223	21	16	21	16	Could 3,3 Gha be expressed as 3 300 Mha or 33 million km2 as these units are used in other parts of the SPM [Harold Leffertstra, Norway]	Harmonised throughout SPM
14585	21	17	21	18	Suggested revision: Many of these grassland areas are very biodiverse but currently have low average food crop productivity and provide valuable pasture, but are not well suited for annual crop production. [., Canada]	Statement has been substantially rewritten and revised in response to reviewer comments
13453	21	18	21	18	This could discourage developing countries to do climate-smart sustainable intensification, especially if biodiversity loss could be subjected to higher risks. [Lourdes Tibig, Philippines]	Statement has been substantially rewritten and revised in response to reviewer comments
23057	21	18	21	21	Referred adverse risks should be further elaborated. [Anastasios Kentarchos, Belgium]	Statement has been substantially rewritten and revised in response to reviewer comments
32923	21	18	21	21	The underlying chapter includes agroecology in the list of integrated practices. Another sentence should be added here to note that some integrated practices, such as agroecology and agroforestry, which are not intensification approaches, instead include practices against biodiversity loss and deforestation. [Doreen Stabinsky, United States of America]	Statement has been substantially rewritten and revised in response to reviewer comments
25969	21	18	21	21	It should be noted that conservation agriculture may overuse more pesticides to combat weeds due to no tillage practices. [., France]	Statement has been substantially rewritten and revised in response to reviewer comments

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25971	21	18	21	21	It really depends on the former land use. [, France]	Statement has been substantially rewritten and revised in response to reviewer comments
31581	21	19	21	19	... conservation agriculture and climate smart agriculture, may provide ... (climate smart agriculture is a political label and redundant to conservation agriculture and any other sustainable practices. The use of the term is highly debatable) [, Brazil]	Statement has been substantially rewritten and revised in response to reviewer comments
17739	21	19	21	19	A definition of climate-smart agriculture would be useful to include, for example in the glossary. [, Sweden]	Statement has been substantially rewritten and revised in response to reviewer comments
26087	21	19	21	19	Delete the word "may" [Reid Detchon, United States of America]	Statement has been substantially rewritten and revised in response to reviewer comments
8861	21	19	21	21	it is not clear how sustainable conservation agriculture could exacerbate biodiversity loss [Jean-Luc Chotte, France]	Statement has been substantially rewritten and revised in response to reviewer comments
3953	21	20	21	20	Write: "... exacerbating biodiversity and ecosystems loss, ...". [, Switzerland]	Statement has been substantially rewritten and revised in response to reviewer comments
31583	21	20	21	21	Delete the phrase "but at the risk of exacerbating biodiversity loss, and deforestation". Justification: the sentence is completely out of context, because in the draft it appears to apply to the "integrated practices" example, which is not logical, because those practices do not rely, per se, on expanding land for agriculture, but on integrating uses for existing land. Further, and maybe most importantly, the phrase or idea proposed to be deleted is completely absent from the provided reference (5.6.1). [, Brazil]	Statement has been substantially rewritten and revised in response to reviewer comments
20861	21	20	21	21	The draft discusses sequestration options and, to our view, does not pay enough service to the issues/risks in increasing carbon stocks in soil. The draft mentions risk to biodiversity, this needs to be given a little more acknowledgement such as why is there a risk so that people understand. We also don't see any mention of issues around increasing soil carbon leading to risks of reduced productivity within the soil. [, United Kingdom (of Great Britain and Northern Ireland)]	Statement has been substantially rewritten and revised in response to reviewer comments
38373	21	22	21	22	Section B4.4 states, "Large-scale deployment of land-based CDRs also implies ambitious investments and policy interventions for protection of ecosystem services, including food production." This should be 'requires' instead of 'implies'. [, United States of America]	Statement has been substantially rewritten and revised in response to reviewer comments
33001	21	22	21	24	Large-scale deployment of land-based CDRs also implies ambitious investments and policy interventions as well as strong regulation and governance of bioenergy production for protection of ecosystem functions and services, including food production. [Christopher Pereira, Canada]	Statement has been substantially rewritten and revised in response to reviewer comments
23059	21	22	21	25	Modify as follows: "Large-scale deployment of land-based CDRs also implies ambitious investments and policy interventions as well as strong regulation and governance of bioenergy production in order to for protection of biodiversity and ecosystem services, including food production. Such conditions may be challenging particularly to developing countries." The tone of the § seems to assume that such investments are absolutely needed, but the previous ones alerts about the impacts. Maybe the tone should be more nuanced. "Regulation and governance" does not necessarily mean that the negative consequences (e.g. on biodiversity and ecosystem services) will be mitigated. See for instance the EU's Renewable Energy Directive and its impacts on deforestation... [Anastasios Kentarchos, Belgium]	Statement has been substantially rewritten and revised in response to reviewer comments

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23061	21	22	21	25	This statement needs to be more carefully stated. Firstly, because it is true for almost all major physical investments. Secondly because ecosystem services and food security are very different from a regulatory perspective. Protection of ecosystem services would require effective governance and regulation at the local/regional level since it is location-specific. Thirdly, it is surely better to refer to food security rather than production. Food commodities are widely traded - and there are many ways to safeguard food security (as B5.3 states). It is not clear why regulation of bioenergy production to protect (local?) food production would be needed. Finally, energy security (i.e. access to modern energy services) is also an issue which, like food security, affects the most vulnerable. [Anastasios Kentarchos, Belgium]	Statement has been substantially rewritten and revised in response to reviewer comments
6441	21	22	21	25	It is also challenging for developed countries, such as in the EU, where the right incentives for ambitious investments and policy interventions are lacking, e.g. due to the regulatory framework surrounding emissions accounting from carbon sequestration in soils and forests, as well as conflicting regulation between climate and other environmental concerns such as nitrate leaching and ammonia emissions. SUGGESTION for changed text: There may also be policy barriers in developed countries, where the right incentives for investments and policy interventions are some times lacking, e.g. due to the regulatory framework surrounding emissions accounting from carbon sequestration in soils and forests, as well as conflicting regulation between climate and other environmental concerns such as nitrate leaching and ammonia emissions. [, Denmark]	Statement has been substantially rewritten and revised in response to reviewer comments
925	21	22	21	25	It will be advisable to use the acronym NET along with CDR in the SPM, as NET is now well known in scientific and other communities. Large scale deployment of NETs or CDRs is going to be a reality, soon after the Paris Agreement comes into force. The developing countries specifically, will need to ensure food security before embarking on a large-scale implementation of NETs. Adoption of NETs before ensuring food security, may be counterproductive, and put the developing nations at political and social strain. The countries will be well advised to estimate the land resource required for adequate production of food, and first of all, set aside this extent of land to be used for food production only. NETs or CDRs could be set up on the remaining land judiciously taking due note of other requisite land uses, like grazing, mining, urbanisation, etc. [Jagdish Kishwan, India]	Statement has been substantially rewritten and revised in response to reviewer comments
29267	21	22	21	25	I would think interational coopertation also should be mentioned here. [Jan Fuglestedt, Norway]	Statement has been substantially rewritten and revised in response to reviewer comments. International cooperation also addressed in SPM Section C
8863	21	22	21	25	overcoming the challenging conditions for implementing large scale CDR will require a global financing mechanism such as the LDN fund, mobilized in a harmonized way for greatest impact (as is the objective of the UNCCD's Global Mechanism). [Jean-Luc Chotte, France]	Statement has been substantially rewritten and revised in response to reviewer comments. Role of finance also in SPM Section C
32393	21	22	21	25	It would be appropriate to highlight the risks of land-related conflicts and forced migration related to large-scale CDR that are described in Chapter 1, especially Cross-Chapter Box 1. [Simone Lovera-Bilderbeek, Paraguay]	Statement has been substantially rewritten and revised in response to reviewer comments
22111	21	22	21	25	B4.4-Please check and kindly address: The approach, responsibility, capacity will be differernt in developed and developing countries. The issue of cost of action and inaction, both may be addressed in this context for the developed and developing nations. [Suvadip Neogi, India]	Statement has been substantially rewritten and revised in response to reviewer comments

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23063	21	24	21	24	after "food production", add: "and the protection of existing forests". This is important as forests would be the most likely source of biomass for energy, and forest protection is also included (simulated) in the models. [Anastasios Kentarchos, Belgium]	Statement has been substantially rewritten and revised in response to reviewer comments
27671	21	24	21	24	"... ecosystem services, including food production": Is it necessary to define all food production as "ecosystem service"? Better: "... ecosystem services and food production". Please see also our general comment on ES on the Entire Report. [, Germany]	Statement has been substantially rewritten and revised in response to reviewer comments
20863	21	24	21	25	We would like to see more exploration on the trade-offs between food production and bioenergy, the present draft feels like a token acknowledgement. [, United Kingdom (of Great Britain and Northern Ireland)]	Statement has been substantially rewritten and revised in response to reviewer comments. New statement on food security added (B5.5)
6871	21	26	21	26	add a para on the negative implications for access to land to local land users and the need to prevent land grabbing in face of the additional massive demand for land. Refer to 6.3.3.2 [Markus Giger, Switzerland]	Statement has been substantially rewritten and revised in response to reviewer comments
12597	21	27	21	27	Strong recommendation to lead with demand- side measures in this section, inasmuch as we know that intensification of production would not be necessary if demand-side measures were widely implemented, especially food waste prevention and the shift to low-carbon, healthy diets [Carina Millstone, United Kingdom (of Great Britain and Northern Ireland)]	Thank you very much for the comment. We highlighted the role of both demand and supply side measures in this section.
30127	21	27	21	28	Add "demand-side and supply side mitigation options" to the list of examples between brackets to better align with the reference to figure SPM 7. [, Netherlands]	Many thanks. The revised version mentioned both demand and supply sides.
23065	21	27	21	29	Cooking is missing. Justify in Chapter 5 and Chapter 1 [Anastasios Kentarchos, Belgium]	Yes, it is missing. However, this is beyond the provided scope of the chapter.
25973	21	27	21	29	The title mentions food system contribution to climate change mitigation and adaptation but all the sub-paragraphs deal with mitigation aspect, we suggest to add some elements on adaptation, and to mention agro-ecology (chp. 5.3.1, cf. Général comment on agroecology) [, France]	We added the adaptation aspect as well.
38375	21	27	21	29	Should you just call this life cycle analysis? [, United States of America]	We avoided using the term LCA. This is because only some analysis assessed are based on LCA.
22113	21	27	21	29	B5-Please check: kindly provide confidence statement. [Suvadip Neogi, India]	We added confidence statement.
29757	21	27	21	29	harvesting food should be acknowledged here to account for the non-industrial components of food systems; otherwise, the section should specify its focus on industrial food systems [Tanya Smith, Canada]	We elaborated the HS. Harvesting food is explicitly included in supply side.
30123	21	29	21	29	Add reference to section 5.6.5, and figure 5.16 because that are the places in chapter 5 that deal with transport, packaging, and storage. [, Netherlands]	Many thanks we added the references to the chapter
30125	21	29	21	29	Add references to section 5.7.1 and Table 5.7. [, Netherlands]	Many thanks we added the references to the chapter
32927	21	30	21	31	In a situation of biodiversity crisis, one must consider the links between these crises. Land intensification is not necessarily the correct approach in many places. [See Kremen and Merenlender 2018; Isbell 2015; Prieto et al 2015; Altieri et al. 2015] Agroecological approaches which share land between different uses -- think agrosilvopastoralism -- can produce food and conserve and enhance biodiversity at the same time. Change the sentence wording to "... mitigation by sustainable use of land and carbon sequestration in soils in biomass." Delete "efficiently intensifying." See comment earlier about a judicious use of the word "efficient." Without units defining your efficiency this is really a meaningless and often rather deceptive term. [Doreen Stabinsky, United States of America]	We made changes in this statement and "efficiently intensifying" is also removed.
23067	21	34	21	34	Exchange "policy interventions" with "enabling conditions, including markets, governance, and socio-cultural settings" (or similar) [Anastasios Kentarchos, Belgium]	For being policy descriptive, we removed the term "policy interventions" in the revised version.
31585	21	35	21	35	... include improved land, soil and fertiliser management, ... [, Brazil]	We replace this with "improved cropland management".

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25975	21	35	21	36	Emphasis is put on biochar whereas its potential to mitigate climate is still under research. As for other waste products (e.g. compost, manure, slurry, sludges) biochar has a strong local potential to enhance soil properties but its use as a global solution is still questionable. [, France]	We removed biochar from this section.
25977	21	35	21	36	After fertiliser management, we suggest to add "including legumes in the rotation, soil organic matter, recycling of organic matter like manure, compost, sludge, digest, slurry" [, France]	Due to limited space, we condensed the text in this section. Thus, we are unable to include this suggestion.
24585	21	35	21	36	Biochar seems to have a high profile here but has limitations and drawbacks which should be referenced in the text [, Ireland]	We removed biochar from this section.
30207	21	35	21	42	Mitigation potentials are given for different dates: for cropping systems 2030 and for livestock systems 2050. That is confusing. Section 5.5.1 also gives those dates. [, Netherlands]	We provided only one date in this sub-section now.
23069	21	36	21	36	Is there any 'breeding for larger root systems'? If so, it should be elaborated in the report. It should also be clarified how "bridging yield gaps" can add to mitigation. [Anastasios Kentarchos, Belgium]	We replaced this with genetic improvements. We avoided the term "bridging yield gaps" in the revised version.
14587	21	36	21	36	Genetic measures should perhaps be broadened beyond 'breeding for larger root systems'. [, Canada]	Sure. We replaced this with genetic improvements.
16471	21	36	21	36	Biochar application is not improved completely. Making biochar would be too expensive until now. So it is not popular. Instead, would like to insert 'applying organic matter with long term'. [, Republic of Korea]	Many thanks. We removed discussion on biochar from this section.
7743	21	37	21	37	Period after '...by 2030' is duplicated. [Hiroaki Kondo, Japan]	Many thanks. We removed this.
29269	21	37	21	37	I suggest avoiding using aggregated emissions. Much better to give information by gas. Aggregating two so fundamentally different gases as CO2 and CH4 is highly problematic. And you do not even state which GWPs you have used for this. [Jan Fuglestedt, Norway]	Many thanks. Where ever literature provide values in different gases we avoided aggregation in the revised version.
23071	21	37	21	39	"Options for mitigation in livestock systems include better manure management, improved grazing land management, and better feeding practices for animals". ==> Some examples of such practices should be mentioned in the SPM, in order to give clear policy orientations to policy-makers. [Anastasios Kentarchos, Belgium]	Due to limited space, we condensed the text in this section. Thus, we are unable to include this suggestion.
30443	21	37	21	39	Mitigation options for livestock production are actually more than the ones listed. FAO and partners identify 3 main strategies to mitigate GHG emissions from livestock: (1) improving efficiency in production (which includes improvements in feeding, breeding husbandry and animal health); (2) carbon sequestration in soils and especially in pastures through improved grazing management; (3) improving the circular bioeconomy (for example for using crop residues as feed and manure as crop fertilizers. http://www.fao.org/3/I8098EN/I8098en.pdf [Anne Mottet, Italy]	Due to limited space, we condensed the text in this section. Thus, we are unable to include this suggestion.
6443	21	37	21	39	Also genetic selection of ruminants to reduce enteric fermentation [, Denmark]	Due to limited space, we condensed the text in this section. Thus, we are unable to include this suggestion.

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25979	21	37	21	39	We believe herd management is a good pool of practices that can lead to mitigation, and propose to add in B5.2 of the SPM that Herd management can also be improved (decreasing birth mortality, improving sanitary conditions and health, herd renewal...) in order to decrease unproductive periods, when GHG are emitted with no outcome), and there are also some genetic responses with the choice of adapted races for the animals, and also for the species used as feed (grazing management, protein content and equilibrium of the amino acids etc.). Some of these options are present in the chapter 6 (6.3.1.3), but not all of them, 6.3.1.3 could be completed. For some solutions proposed in this paragraph to reduce emissions from enteric fermentation, there is few evidence on the long term effects on the animals and on the environment, on the costs, on the social acceptance and regulatory authorisations (for example ionophores / antibiotics, propionate enhancers, archaea inhibitors, nitrate and sulphate supplements, microbial technology such as archaeal vaccines, methanotrophs, acetogens, defaunation of the rumen, bacteriophages and probiotics). We propose to have these practices appart from the others, and with a warning message on the possible side effects for the animals and the environment. [, France]	Due to limited space, we condensed the text in this section. Thus, we are unable to include this suggestion.
8225	21	37	21	39	The use of to different years – 2030 and 2050 – makes comparing difficult [Harold Leffertstra, Norway]	We provided the value of only one year now.
24439	21	38	21	38	The report is often vague and lacking concrete proposals and analysis of measures of land use management too vague too general there are many different options for example 'better feeding practices for mitigation in livestock systems. The global research alliance - farmers identifies lots of possible options for improving grazing and livestock management, some of them are immediately applicable, others are pilot studies and concepts. A measure which is often mentioned is to change the diet of animals to reduce CH4, but there is no proof of efficiency and there are risks of toxicity for the animals and for people eating the product. It is presented as if it could be implemented immediately but this is probably not so One should select measures for which there is a proof of efficiency, if possible. [, Belgium]	Many thanks, we replaced this with "higher-quality feed".
31587	21	38	21	38	...improved animal and grazing land management, ... [, Brazil]	Many thanks. We considered provided options are part of improved animal management.
26259	21	39	21	39	Please also provide figures for 2030 the total mitigation potential in order to compare to previous figures. [, Luxembourg]	Many thans. We provides the figure for 2030 only in the revised version.
29387	21	39	21	39	I suggest avoiding using aggregated emission. Much better to give information by gas. Aggregating two so fundamentally diferent gases as CO2 and CH4 is highly problematic. And you do not even state which GWPs you have used for this. [Jan Fuglestedt, Norway]	Many thanks. Where ever literature provide values in diferent gases we avoided aggregation in the revised version.
27673	21	39	21	42	"Reductions in GHG intensity ...", a remark should be added that rebound effects of such options have to be controlled / limited. We suggest providing a more comprehensive assessment of this aspect in the report, including chapter in 5, as there is currently only limited information on rebound effects. If knowledge gaps prevents such an assessment, please mention these gaps in an appropriate manner. [, Germany]	We mentioned "governance for total production" needed in the statement to consider rebound effects.
20871	21	40	21	41	We think the draft could be made clearer that the absolute emissions reduction is based on herd size remaining exactly the same or shrinking. [, United Kingdom (of Great Britain and Northern Ireland)]	We tried to make your statement policy descriptive and thus did not mentioned about the herd size.
14589	21	40	21	42	GHG emission intensity reductions are possible for all commodities, therefore this statement could be expanded to include crops. [, Canada]	We agree. However, crop management mentioned in the previous statements implicitly includes reduction of emission intensity in crops.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
14591	21	41	21	41	Suggested addition of text: ...in absolute emissions in some contexts (e.g., improved genetics, feed additives, reduction in herd size at constant pasture area,...) [, Canada]	Due to limited space, we did not mentioned these details.
7447	21	41	21	42	also add "improvement of the productivity of rangelands" [tarig Ibrahim, Sudan]	This is implicitly included in grazing lands.
23051	21	1	22	22	Section B4 & B5: general comments * Section B4 - The summary statement needs to better reflect the scope of the whole section. But what is the scope of the section? The potential side effects of CDR (as the summary statement implies)? the need for land-based mitigation more broadly (which is not the same as CDR)(as in statement B4.1)? The best way forward would be to dedicate the section to bioenergy and CDR (since land-based mitigation more broadly seems to be part of other sections). The section should then be ordered as follows: 1) potential contribution of bioenergy and land-based CDR; 2) potential requirement for bioenergy and CDR in the context of other options (B3.3 should be placed here); 3) potential implications of bioenergy and CDR. The section should also not conflate the two (even if BECCS appears to be the dominant form of CDR). Use of biomass for energy and use of CDR technologies (BECCS or other) have their own distinct benefits and drawbacks. * Section B5 - this is another section that could and should be improved by adding specific examples of the practices mentioned in the text, in particular those with the greatest mitigation and adaptation potential. Many such examples are given in figures SPM 6 & 7. Therefore, the text should be used to highlight and elaborate key messages and examples from the figures. [Anastasios Kentarchos, Belgium]	Statements have been substantially revised based on reviewer comments. Section B of SPM also restructured to improve narrative
24583	21	1	22	22	There is important information in these sections; however, the purpose and structure should be a lot clearer, more data should be provided, and this information should fit a narrative for the Report. This section could also address the potential and limits of land-based mitigation and point to the need for other solutions if these are not feasible. This may reflect limits of models or scientific understanding which can be addressed through research, and the need for more direct inputs from practitioners, as well as improved MRV for AFOLU. Statements on these issues, as well as specific examples, would be more useful than broad statements [, Ireland]	Statements have been substantially revised based on reviewer comments. Section B of SPM also restructured to improve narrative
30401	21	1	22	22	B4/B5: It is not balanced to only mention mitigation options of food sytems or agricultural measures expressed in terms of amounts of Gt CO2 eq/y like is done in the text of B5 and to leave out of the main text the impact of climate mitigation option for land use change and carbon sink enhancement expressed in Gt CO2 eq/y as mentioned in Figure SPM6. [, Netherlands]	Statements have been substantially revised based on reviewer comments.
17417	21	1	22	25	BECCS appears as superior to all other mitigation measures, in terms of mitigation potential. Yet, so far it only exists in models and theory, while other measures could be implemented right away, with bigger co-benefits. Hence, it would be important to add further considerations/comparison of the viability of these different options in the SPM - including in the Figure SPM 6 - maybe through some color coding? [Taehyun Park, Republic of Korea]	Statements have been substantially revised based on reviewer comments.
20865	21	25	22	2	The timeframes of the three mitigation potentials mentioned in B5.2 should be harmonised, given one is currently by 2030, one is by 2050, and one is not specified. [, United Kingdom (of Great Britain and Northern Ireland)]	Statements have been substantially revised based on reviewer comments.

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20867	21	27	22	22	This section helpfully gives an indication of the mitigation potential of diet change, and B5.5 specifies dietary changes that there is the most scope for, but it currently does not highlight what actions would be most effective. These messages would be key for a policy maker to understand what actions are important to take. For example, the underlying report states that '...meat – sometimes specified as RPM or ruminant meat (beef and lamb) – was consistently identified as the single food with the greatest impact on the environment, on a global basis, most often in terms of GHG emissions and/or land use' (chapter 5, p5-70 lines 40-42), and one of the referenced studies (Bryngelsson et al, 2017) concludes that 'This means that a general reduction of meat consumption is a far less effective strategy for meeting the 2C target than a reduction of beef and dairy consumption. [, United Kingdom (of Great Britain and Northern Ireland)]	Many thanks. The revised section highlight what specific changes are needed in terms of diets.
20869	21	27	22	22	This section currently fails to address what diets are compatible with given levels of limiting climate change, which is a key message as it can correspond directly to what actions are necessary for achieving the Paris temperature goal. The underlying report states that 'Several studies highlight that current dietary trends lead to approximately 20Gt CO2-eq by about 2050 and that this would make achieving the Paris Agreement targets [word missing - presumably challenging/impossible?]' (chapter , p5-72, lines 4-7) and that '...only by adopting a “flexitarian diet”, as a global average, would climate change be limited to under two degrees' (chapter 5 p5-72 lines 17-18). These are important messages that should feature in the summary for policy makers. [, United Kingdom (of Great Britain and Northern Ireland)]	Many thanks. We have guidelines to make our statement policy descriptive. We follow this guideline in this statement.
30129	21	35	22	2	The mitigation potentials mentioned cannot be understood in combination with figures SPM 6 and SPM 7. For example, according to statement B5.2 agroforestry has a potential of 4.27 to 21.5GtCO2eq per year (we think this cannot be true; see other comments). However, figure SPM 6 shows a potential of 0.1 to 0.55 (which we think is more in line with the literature)! Also, the options for livestock management in figure SPM 6 add up to a much lower number. [, Netherlands]	Many thanks for raising this. We made all the values of mitigation potential consistent in the report
33939	21	35	22	2	Para B5.2 is very important and describes many options that shows potential for mitigation in the agriculture sector. However, in addition we propose that the SPM also describe the finding from Chapter 2 page 97 line 32-35 since this both gives relative numbers within the sector, and also underline the connection to global warming in the short term. [, Norway]	Many thanks. We made the values of mitigation potential consistent with the chapter 2.
3955	21	35	22	2	Would it be possible in this paragraph B5.2 to have data on the mitigation potential in the same years (2030 and 2050) for the sectors cropping, livestock and agroforestry? [, Switzerland]	We provided only one date in this sub-section now.
27721	21	35	22	2	This point is quite technical. E.g. a brief rewrite of or explanation of 'bridging yield gaps' and the agroforestry practices would be helpful to non-experts. [Helene Muri, Norway]	We removed the technical term "yield gaps" with more general explanation.
17425	21	35	22	2	The figures in the text here should correspond to the graphic (SPM 6) [Taehyun Park, Republic of Korea]	We referred to the relevant graphics in the SPM.
12931	21	35	22	2	B5.2: There is no agreed conversion to generate GtCO2eq yr-1 (note table SPM1 writes the units as "GtCO2e per year"). This would be more scientifically accurate if CO2, methane and N2O mitigation were quoted separately, rather than aggregating them in the controversial CO2eq. [William Collins, United Kingdom (of Great Britain and Northern Ireland)]	Many thanks We made them consistent.
29941	21	42	22	1	What is the mitigation potential of the agroforestry systems? [, Estonia]	We removed this in the revised version.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
25981	21	42	22	1	We propose to delete from rotational to use, cause it doesn't explain what is agroforestry and puts an emphasis of what is not the main part of agroforestry. We propose instead "trees in agricultural production in the same field, like hedgerows, tree lines in fields, etc." ref 5.5.1.3 [, France]	We removed this.
7741	21	27	23	7	The unit for mitigation potential is inconsistent. Before this part, CO2e is used but here CO2eq is used. [Hiroaki Kondo, Japan]	Many thanks We made them consistent.
4941	21	35	23	7	The source of Figure SPM 7 is Figure 5.12 which comes from Paustian et al. (2016). Paustian et al. (2016) derived the estimate of maximum potential of biochar from Woolf et. al (2010). The aim of Woolf et al. (2010) is to provide and estimate of the theoretical upper limit of biochar based on "sustainability criteria" which mainly means biochar production is in line with sustainable agriculture and silviculture residue amount. Some of the articles about biochar mentioned in this SR indicate both pros and cons of biochar. For instance, Simon (2017) indicates the effect of biochar applications to increase of crop yield has regional dependency and concluded not effective to temperate region, Frenkel (2017) indicated both too much application and too little application of biochar have negative effect to plant growth. The result of Woolf et. al (2010) itself is respective to provide the maximum potential of biochar mitigation, but it is not quite sure whether this estimation fully takes into account the negative aspects of biochar application. So, we are concerned that it might be risky to include the maximum potential of biochar as the top mitigation option in SPM level, based on one article. [, Japan]	Many thanks. We removed discussion on biochar from this section.
7441	21	18			Please write "below average" instead of "low average" [tarig Ibrahim, Sudan]	Thanks. Rephrased
27719	21	22		25	Not only bioenergy production need strong governance and regulation. This applies to all forms of CDR. Afforestation and biochar also needs to be done 'right' and monitored. Carbon accounting and quota system regulation also applies to the land-based CDR options. This should be added and clarified. [Helene Muri, Norway]	Statements revised. Governance also in SPM section C
32925	21	22			What do the authors mean by "large-scale deployment of land-based CDRs"? Does this phrase include agroforestry? Forest and ecosystem restoration? If not, then you need to be specific about technologies, because land-based CDR is a large category. If you just mean BECCS and AR, then say that. Don't provide cover for those particularly problematic technologies with the neutral label of "land-based CDR." [Doreen Stabinsky, United States of America]	Statements have been substantially revised based on reviewer comments.
23265	21	30			Important at some point to state that 'supply-side' and 'demand-side' responses can be intimately linked. [Mark Howden, Australia]	We agree. However, the focus of this section is on supply side and to avoid confusion, we only highlighted supply side here.
2101	21	32			Robust Evidence/high agreement [Tomas Molina, Spain]	We provide the confidence level differently in the revised version.
7445	21	35			Please write "improved cultural practices" instead of "improved land and fertiliser management" [tarig Ibrahim, Sudan]	Many thanks. We replace this with "improved cropland management".
16473	21	37			..' --> .' [, Republic of Korea]	Many thanks, we removed it.
7443	21	37			remove one full stop [tarig Ibrahim, Sudan]	Many thanks, we removed it.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
31593	22	8	8	19	<p>Those two paragraph (mainly B5.5, and others in the document Chapter 2, pg 98) use the premise that eating less meat reflects in lower emissions. There are references that it is not correct or, at least, not a "robust evidence, high agreement". We are not comfortable with that and recomend paragraph B5.5 to be removed.</p> <p>Reference examples:: Stanley, P. L., Rowntree, J. E., Beede, D. K., DeLonge, M. S., & Hamm, M. W. (2018). Impacts of soil carbon sequestration on life cycle greenhouse gas emissions in Midwestern USA beef finishing systems. <i>Agricultural Systems</i>, 162, 249-258.</p> <p>Nijdam, D., Rood, T., & Westhoek, H. (2012). The price of protein: Review of land use and carbon footprints from life cycle assessments of animal food products and their substitutes. <i>Food policy</i>, 37(6), 760-770.</p> <p>de Oliveira Silva, R., Barioni, L. G., Hall, J. A. J., Matsuura, M. F., Albertini, T. Z., Fernandes, F. A., & Moran, D. (2016). Increasing beef production could lower greenhouse gas emissions in Brazil if decoupled from deforestation. <i>Nature Climate Change</i>, 6(5), 493. [, Brazil]</p>	We modified the statement and highlight the role of "healthy and sustainable diets" in climate change mitigation.
12599	22	1	22	1	Suggested addition: after 'long-term fallow' add 'perennial crops to promote carbon sequestration' [Carina Millstone, United Kingdom (of Great Britain and Northern Ireland)]	To shorten the section, we remove the description of agroforestry.
26261	22	1	22	1	Also, provide here figures for 2030 and 2050 in order to compare to previous figures. [, Luxembourg]	We provided the figures for only one year.
32937	22	1	22	2	This description leaves out important types of agroforestry systems practiced in the global south. Multi-storey home gardens, kitchen gardensmulti-strate crop systems, silvopastoral systems. The types currently listed tend to be more relevant to the global north, so to have a more global coverage those systems practiced in developing countries should also be included in the list and in the analysis throughout the report. [Doreen Stabinsky, United States of America]	To shorten the section, we remove the description of agroforestry.
17821	22	1	22	2	The total mitigation potential of "what" is estimated to be 4.27-21.5? Agroforestry? Reductions from livestock and animal products? [Quentin Lejeune, Germany]	To shorten the section, we remove the description of agroforestry.
29271	22	2	22	2	I suggest avoiding using aggregated emission. Much better to give information by gas. Aggregatig two so fundamentally different gases as CO2 and CH4 is highly problematic. And you do not even state which GWPs you have used for this. [Jan Fuglestedt, Norway]	Many thanks, we used the disaggregatee emissions when ever literature provide.
15017	22	2	22	7	Needs revision. The literature cited in section 5.3.1 does not support the conclusion that diversification is a key element for increasing resilience (see my related comments above). Unclear language as well here. Why would increasing agrobiodiversity be an alternative pathway to diversification? [Katharina Waha, Australia]	We modified the statements. Now, they are clear and focused on diet diversity.
23073	22	3	22	7	Add: insurance, early warning, climate-resilient breeding, etc. to complement traditional and local knowledge as ways to manage climate risk. [Anastasios Kentarchos, Belgium]	We modified this statement. Due to limited space, we did not include this suggestion.
7267	22	3	22	7	An assessment of this bullet point is required. [Debra Roberts, South Africa]	We modified the statement and also provide confidence level.
24587	22	3	22	7	Elaborate and clarify points on diversification and also provide some confidence levels [, Ireland]	We modified the statement and also provide confidence level.
3041	22	3	22	7	An uncertainty qualifier would be appropriate for the whole statement. [, Russian Federation]	We modified the statement and also provide confidence level.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
1595	22	3	22	25	UK work organisations might be further encouraged by the UK government to enact all such initiatives here, e.g. to introduce new diets options in UK workplace canteens & cafes, for their organisational Human Resources (HR) departments or functions to publicize such new diet options & make more effort to reduce food waste across UK work organizations more widely too. Indeed, global governments could better publicize more use of low-carbon diets, efforts to tackle food waste, and resultant, better human health impacts arising too, if they have not already done so. [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	Many thanks. Let's hope this report will contribute to make change happen.
31589	22	4	22	4	... and reducing vulnerability to climate driven risks. ... [, Brazil]	Many thanks. Since we need to condense the statement, we did not include this suggestion.
32591	22	4	22	5	The 'many' alternative pathways that can increase resilience, suggested here –'increasing agrobiodiversity, using indigenous knowledge and local knowledge, and developing local food systems' are intertwined pathways reflecting agroecological practices and community based resource use knowledge which co-evolves with agricultural and climatic conditions. It is essential that these 'pathways' are identified for their commonalities, their differences and rightly acknowledged with the terms. Agroecology encompasses use of agrobiodiversity, community based knowledge and developing appropriate food system based on local needs and resources. The report should acknowledge agroecology for what it encompasses, and others such as indigenous knowledge and local knowledge for their roles. [Neeraja Havaligi, United States of America]	We modified the section and removed our statement on alternative pathways.
25983	22	4	22	6	We suggest to add dietary diversity at the farm level and beyond. [, France]	Many thanks. Since we need to condense the statement, we did not include this suggestion.
17833	22	4	22	7	What is specifically meant by "developing local food systems" is not clear [Quentin Lejeune, Germany]	We modified the statement. "Local food systems" is not mentioned now.
8803	22	5	22	5	Here only "... indigenous knowledge and local knowledge" are mentioned. On page 13 (L13) you also mention traditional knowledge. Kindly ensure consistency in the use of terminology throughout the SPM. Also cross-check with p. 25, L19-20. [Jean-Luc Chotte, France]	We tired to make the terminology consist.
31591	22	5	22	6	... local knowledge, and developing local food system, alongside with the reinforcement of the already known conservation agriculture and sustainable agricultural practices as well as innovation and technology development. (comment: The respect and effective integration of ILK are pivotal and urgent. However, they are not sufficient, and might be inadecuate in some occasions, in an increasing uncertain context, such as this one imposed by climate change. It is pivotal that IPCC supports, with the language of its document, a clear undestrading of the need of an integrative knowledge, and respect for all efforts, without overvaluing one in detrimental of the other. ILK is as important and as good as other knowledge origin and the efforts to include them should not overshadow other sources of knowledge.) [, Brazil]	We removed the term "IKIL" from this section.
16475	22	5	22	6	'Using indigenous knowledge and local knowledge, and developing local food systems' is to be changed 'using indigenous knowledge and local knowledge, developing local food systems, conserving agricultural practice. [, Republic of Korea]	We tired to make the terminology consist. Please also note that the statement has been changed.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
32569	22	5	22	7	<p>This is one example of text that talks about “alternative pathways that can increase resilience, including increasing agrobiodiversity, using indigenous knowledge and local knowledge, and developing local food systems”. Agrobiodiversity, use of indigenous knowledge and local knowledge and developing local food systems are all included and part of agroecological practices practiced by farmers from millennia across geographies and cultures. The report clumps these terms together and (perhaps) unwittingly undermines agroecology as a tool for climate change mitigation and adaptation, without giving agroecology its due in the document. It is important to parse out these terms- indigenous knowledge, local knowledge, and agroecology- their role in local food systems and in being tools for climate change adaptation and mitigation. Clearly, indigenous knowledge and local knowledge cannot be substituted to agroecology. Based on current text, these are used interchangeably- diminishing their value and impact as tools that can change the course of climate events.</p> <p>Indigenous knowledge mentioned many times in all the chapters is a dynamic knowledge system and a way of life of diverse indigenous peoples. The knowledge of the indigenous communities evolve over time, landscapes, social and cultural practices and structures, a result from their close relationships with and responsibilities to the natural resources (land, water, forests-plants/animals etc.) which is vital to the nurture indigenous people and it reflects the dynamism and plurality of this knowledge, also reflecting the living indigenous governance systems, cultural contexts and access to resources (Berkes et al 2000).</p> <p>Agroecology provides a multidimensional view of food systems within ecosystems, building on traditional knowledge, indigenous knowledge and co-evolving with the experiences of local people, the available autochthonous natural resources, access to these resources, and the ability to pass-on/share knowledge between and with communities and generations, emphasizing the inter-relatedness of all agroecosystem components and the complex dynamics of ecological processes (Vandermeer, 1995). Agroecological practices recycle biomass, regenerate soil biotic activities, strive to attain balance in nutrient flow securing favorable soil and plant growth conditions, minimize loss of water, nutrients and better harvesting of solar radiation by efficient microclimate management, soil cover, appropriate planting time and diversity, promoting ecological processes and services such as nutrient cycling, predator/prey interactions, competition, symbiosis, successional changes etc. to benefit human and non-human communities in the ecological sphere, with fewer negative</p>	We removed the term "IKIL" from this section. Please also note that the statement has been changed.
12989	22	8	22	14	<p>‘Mitigation potential of dietary changes’. Do the numbers refer to the difference between a business as usual diet and the specific diets? Are the units assuming 100% global uptake? It perhaps need to be mentioned that ‘vegetarian’ means (seafood/meat once a month- as per fig 5.14). [Aidan Farrell, Trinidad and Tobago]</p>	Many thanks, in the revised statement we avoided mentioning the individual diets and added what difference mean.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
30447	22	8	22	14	Assessments of various diets and their impact on GHG emissions are based on the assumption that one can choose their diet, or in other words they're seen from the point of view of wealthy consumers in industrialized countries. It is important to highlight that choosing one's diet is not an option for a large part of the population and that in many countries and agroecosystems, a nutritious enough diet does include animal source food. In addition, the analysis of various diets and their GHG emissions are all based on kcal and protein intake. They don't look at the whole nutritional balance of the various diets, in particular iron, calcium, zinc, vitamin A and vitamin B12. This statement should be rated as moderate evidence as 1) there is so far only one study looking at a range of micronutrient and 2) no "feasibility" aspect of changing diets has been studied, in particular when it comes to costs of products, incomes and access to markets. In addition, no mention is made of the low carbon livestock initiatives already implemented by the producers and the processors with support of research and academia. See France, Ireland, Italy, UK, and the regional initiative with governments in Latin America (last intergovernmental meeting of CODEGALAC) [Anne Mottet, Italy]	We modified the statement and highlight the role of "healthy and sustainable diets" in climate change mitigation.
3957	22	8	22	14	The link between GHG mitigation potential of some diets and human health that this paragraph presents poses the question if the IPCC is the body capable to assess the effects of diets on human health. Furthermore, it is not evident why a flexitarian diet should have more mitigation potential than a vegetarian diet. Definitions of the different types of diets would be helpful for understanding. [., Switzerland]	Many thanks. These different definitions are provided in the main text. However, the revised section focused on "healthy and sustainable diets".
8227	22	8	22	14	Can it be made clear whether these figures include CO2 from less land use and land use change [Harold Leffertstra, Norway]	We included this in SPM.
24703	22	8	22	14	One could say that the Summary for policy makers is right in saying that "Demand-side changes, e.g., in food choices and consumption, can help to achieve global GHG emission reductions and improve human health (robust evidence, high agreement)." ... but one cannot really say that the following if of high confidence: "By 2050, the mitigation potential of dietary changes relative to business-as-usual food demand projections ranges from 2.7 - 3.4 Gt CO2eq yr-1 for Mediterranean diets, 3.6-6.4 Gt CO2eq yr-1 for healthy diets, 4.3-5.3 Gt CO2eq yr-1 for vegetarian diets and 5.2-5.7 Gt CO2eq yr-1 for a flexitarian diet with limited meat and dairy products (robust evidence, high agreement)" [Heikki Lehtonen, Finland]	We modified this statement.
3845	22	8	22	14	At the end of the actual B5.4 paragraph, add: "Demand changes resulting from a decrease/increase of human population might amplify/cancel such expected reductions" [Philippe Waldteufel, France]	We do not touch effect of population here. This beyond our scope. However, population is explicitly included in other sections while referring to SSPs.
12933	22	8	22	14	B5.4: There is no agreed conversion to generate GtCO2eq yr-1 (note table SPM1 writes the units as "GtCO2e per year"). This would be more scientifically accurate if CO2, methane and N2O mitigation were quoted separately, rather than aggregating them in the controversial CO2eq. [William Collins, United Kingdom (of Great Britain and Northern Ireland)]	We provided the consistent unit in the revised version.
15177	22	8	22	19	The text does not reflect the relationship between food choices and consumption and marketing. [Daniel Zarin, United States of America]	No this does not reflect this relation.
8609	22	9	22	14	Diets based on locally produced food should be prioritized in order to reduce GHG emissions associated with conservation, transport and distribution. [Marc Aubinet, Belgium]	Many thanks. Due to limited space, we did not discuss local food here. However, discussion of short supply chain is provided in chapter 5.
26037	22	10	22	13	Maybe you could add that these figures need to be taken carefully cause the methods are very diverse and these are not many data available [., France]	We removed these figures from SPM.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
27675	22	10	22	14	The statement does not reflect the entire discussion of chapter 5.2.2. There is clear evidence from various studies referenced in the underlying report that diets without any animal products (vegan) lead to the highest GHG reduction compared to any other diets (see 5.2.2.1). This finding should be brought to the attention of the policymakers and therefore included in the SPM. Furthermore it would be helpful to clearly define the differences of the diet categories (e.g. the reader might be confused why a flexitarian (normally meat/fish to some occasions) diet is less carbon intensive than a vegetarian diet (normally without any meat), or why one diet in particular is tagged healthy - which implies all others are not healthy). In particular, the term "Flexitarian" might be understood in various forms of diets and should be rather not used. [, Germany]	Many thanks. However, we stick with sustainable and healthy diet also to address comments from others.
20873	22	10	22	14	Can you please explain somewhere what these different types of diets mean? (It is not clear even in Ch5.) Also, can you be explicit about why the flexitarian diet has a greater mitigation potential compared to a vegetarian diet?, [, United Kingdom (of Great Britain and Northern Ireland)]	Many thanks, we tried to describe the different type of diets.
24775	22	12	22	12	define healthy diets [Viridiana Alcantara Cervantes, Germany]	We provided a definition.
20875	22	12	22	13	"2.7 - 3.4 Gt CO2eq yr-1 for Mediterranean diets, 3.6-6.4 Gt CO2eq yr-1 for healthy diets, 4.3-5.3 Gt CO2eq yr-1 for vegetarian diets and 5.2-5.7 Gt CO2eq yr-1 for a flexitarian diet" - consider rephrasing - implies other diets are not healthy! [, United Kingdom (of Great Britain and Northern Ireland)]	Many thanks. We avoided this disaggregation.
13133	22	12	22	14	this subdivision of alternative diets into "Mediterranean", "healthy", "vegetarian" and "flexitarian" is unnecessary at the level of the SPM, and, in the absence of definitions, is misleading. For instance, all the described diets are "healthy" compared to BAU, not just the one labelled "healthy". suggest to rethink this. The second panel of figure SPM7, adds further unnecessary complexity and confusion. [David Cooper, Canada]	Many thanks. We avoided this disaggregation and mentioned only sustainable and healthy diets with a clear definition.
15319	22	12	22	14	Suggest reviewing the term of 'healthy' diet; the other diets would not be considered 'unhealthy'. It is also not clear why 'flexitarian' diets have a larger GHG mitigation potential than 'healthy' diets. Please also review Figure SPM7 on the same point. [, Australia]	Many thanks. We avoided this disaggregation and mentioned only sustainable and healthy diets with a clear definition.
12601	22	14	22	14	Addition at the end of the paragraph: The most effective dietary change mitigation scenario consists of adopting a largely plant-based diet, limiting animal-source foods to non-ruminant meat and eggs from livestock produced solely from feed that does not compete directly for arable land with human edible crops: unavoidable food waste and by-products (Van Zanten et al. 2018) (Van Zanten, Hannah H. E., Mario Herrero, Ollie Van Hal, Elin Röö, Adrian Muller, Tara Garnett, Pierre J. Gerber, Christian Schader, and Imke J. M. De Boer. 2018. 'Defining a Land Boundary for Sustainable Livestock Consumption'. Global Change Biology 24 (9): 4185–94. https://doi.org/10.1111/gcb.14321 .) [Carina Millstone, United Kingdom (of Great Britain and Northern Ireland)]	Due to limited space, we did not mention these details.
30141	22	14	22	14	Add reference to figure SPM 7. [, Netherlands]	We added reference to SPM figure in the HS.
25985	22	15	22	15	Is there an unambiguous definition of "high-income industrial countries"? Would not "high-income countries" be more relevant? [, France]	Many thanks. This statement is removed.
25987	22	15	22	18	It should be noted that the dynamic is to a strong increase in meat consumption in medium-income countries, while it's slightly decreasing in developed countries. [, France]	Many thanks. This statement is removed.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
23075	22	15	22	19	Why single out high-income industrial countries? Meat consumption in Japan is considerably lower than in several poorer Asian countries. EU meat consumption is considerably lower than in much of America (North & South). Surely the potential for beneficial reductions in meat consumption exists in whichever countries happen to have the highest consumption levels (with the possible exception of certain pastoral communities). The last sentence needs to be strengthened. Stating that a number of approaches "have been tested" adds little value. What evidence is there about which approaches are successful (or indeed evidence on ways to change longstanding dietary norms)? [Anastasios Kentarchos, Belgium]	Many thanks. This statement is removed.
7269	22	15	22	19	An assessment of this bullet point is required. [Debra Roberts, South Africa]	Many thanks. This statement is removed.
7271	22	15	22	19	It might be useful to add potential emission reduction associated with dietary changes. Even a hypothetical scenario might be helpful if there is no actual study quantifying this. [Debra Roberts, South Africa]	Many thanks. This statement is removed.
29943	22	15	22	19	Add evidence/confidence/agreement levels. [, Estonia]	Many thanks. This statement is removed.
25989	22	15	22	19	"It should be noted that the dynamic is to a strong increase in meat consumption in medium-income countries, while it's slightly decreasing in developed countries." [, France]	Many thanks. This statement is removed.
24589	22	15	22	19	Statements need confidence levels and quantification rather than terms such as "tangible" [, Ireland]	Many thanks. This statement is removed.
4943	22	15	22	19	Regarding the sentence "in developing countries, high meat-based diets are less prevalent and scope for reductions may be more limited", future meat consumption in developing countries can be considered to increase, and therefore scope for reductions may not necessarily be "limited". This sentence seems to rest upon an implicit assumption that future meat consumption in developing countries would not increase. Therefore, we would suggest reconsidering this sentence, or it mentioning together that meat consumption in developing countries will increase despite some efforts of reductions. [, Japan]	In the revised version, we did not differentiate developed and developing countries.
30203	22	15	22	19	The statement suggests that for developing countries reduction of meat consumption does not apply as an option. However, in China current meat consumption is already above the recommended level (see https://www.theguardian.com/world/2016/jun/20/chinas-meat-consumption-climate-change). And even for countries that have not yet reached the health related recommended level of meat, breaking the income - meat correlation is very important. The text should be adjusted. [, Netherlands]	Many thanks. This statement is removed.
32395	22	15	22	19	It is a misunderstanding that the countries with the highest meat consumption levels are all high-income industrialized countries. For example, the role of Brazil and Argentina is highlighted in Chapter 2 (2.7.1.2.1). Reduction of meat consumption in these countries would bring significant positive impacts on health and climate change mitigation: In Brazil, for example, more than 80% of beef production is for the internal market (see https://www.agriland.ie/farming-news/the-brazilian-beef-industry-just-how-big-is-it/), while it is one of the main drivers of forest loss (Boucher, 2011) [Simone Lovera-Bilderbeek, Paraguay]	Many thanks. This statement is removed.
815	22	15	22	22	these paragraphs don't include any confidence levels. Either they are updated or the paragraphs should be deleted. [, Spain]	We added the confidence level.
38377	22	15	22	22	B5.5 and B5.6 lack confidence statements. [, United States of America]	We included confidence statements.
3959	22	17	22	17	Write: " ... high meat-based diets are less prevalent but increasing and scope ...". [, Switzerland]	Many thanks. This statement is removed.

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29945	22	17	22	18	What is the projected increase in meat consumption in developing countries? The potential of changing diets should be relative to this. [, Estonia]	Many thanks. This statement is removed.
3961	22	18	22	18	The terminology "low-carbon diet" is also used in the literature for diabetics and refers to diets poor in carbohydrates. Some way to avoid the confusion should be found here. [, Switzerland]	Many thanks. This statement is removed.
25991	22	18	22	19	Would it be possible to characterize the efficiency of these actions? [, France]	Many thanks. This statement is removed.
27677	22	18	22	19	For policy makers it would be interesting to know not only that policies encouraging low-carbon diets have been tested, but whether such policies were successful, and which policy under which circumstances. Please add some language to the SPM, either here or in section D. [, Germany]	Many thanks. This statement is removed.
33941	22	18	22	19	This statement shows different measures that have been tested to change diets. Thus, the authors should consider giving some insight on how applicable/effective these measures have been. [, Norway]	Many thanks. This statement is removed.
24593	22	18	22	23	Note that testing has been done; some data on outcomes would be useful for specific policy interventions. A suite of these could be provided from technical to behavioral [, Ireland]	We provide emissions from food loss and waste for this.
12603	22	19	22	19	Suggested addition at the end of the paragraph: Given the pace and scale of the dietary changes required in high-income industrialised countries to support a low-carbon budget, harder-measures to support a change in diets, such as regulation and taxation, will also be required. (Chatham House, 2015) (Chatham House (2015) Changing Climate, changing diets: Pathways to Lower Meat Consumption) [Carina Millstone, United Kingdom (of Great Britain and Northern Ireland)]	Many thanks. This statement is removed.
20877	22	19	22	19	"have been tested in differing contexts" and have found..? It would be useful if you could follow this up with the results of the testing [, United Kingdom (of Great Britain and Northern Ireland)]	Many thanks. This statement is removed.
12605	22	20	22	20	Addition after 'Reducing food loss and waste throughout the food system': , as per the targets set out in SDG 12.3, [Carina Millstone, United Kingdom (of Great Britain and Northern Ireland)]	Many thanks. However, we avoided referring to SDG here.
23077	22	20	22	22	Provide possible range of mitigation through reduction of food waste [Anastasios Kentarchos, Belgium]	We provide emission share from food loss and waste for this.
7273	22	20	22	22	Quantification of this emission reduction will be helpful. [Debra Roberts, South Africa]	We provide emissions from food loss and waste for this.
29947	22	20	22	22	What is the GHG reduction potential here? [, Estonia]	We provide emission share from food loss and waste for this.
27679	22	20	22	22	This statement B5.6 is quite trivial and does not completely reflect the discussion in chapter 5.5.2.4. There is strong evidence that the reduction of food waste comes with very little adverse side effects (if any, also c.f. table SPM-1) and seems like a "no-regret" option. It offers a large potential of GHG reduction (CO2 and N2O) as well as saving a significant amount of money (c.f. Ch. 5 Executive Summary). We urge the authors to further look into this topic also on SPM level, since it might be of great interest for policy makers. The reference might be wrong, because Figure SPM.7 does not contain any information on food waste, but Fig. SPM.6 does. [, Germany]	We made this statement more objective and removed the reference to the figure.
24595	22	20	22	22	Use of 'will' should be avoided. If projections are available, use these and provide data, uncertainties and confidence levels [, Ireland]	Many thanks we avoided this.
30205	22	20	22	22	Please add a number for the mitigation potential of reducing food loss and food waste. [, Netherlands]	We provide emission share from food loss and waste for this.
30243	22	20	22	22	See also direct and rebound impacts on land use in: PBL (2010). Rethinking global biodiversity strategies: exploring structural changes in production and consumption to reduce biodiversity loss. PBL Netherlands Environmental Assessment Agency. [, Netherlands]	Due to limited space, we did not mention this discussion.

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17611	22	20	22	22	Could refer to SR1.5 findings here as well. [, Sweden]	Many thanks. We also refer to SR1.5 in the relevant statements.
20879	22	20	22	22	Statement B5.6 could be quantified to help contextualise food waste against the other dietary changes mentioned in this section. For example 'global food loss and waste resulted in emissions of 4.4 GtCO ₂ -eq yr ⁻¹ in 2011 (8-10% of total anthropogenic greenhouse gas emissions) and costs of about USD 1 trillion per year' (chapter 5 p5-73 lines9-10) [, United Kingdom (of Great Britain and Northern Ireland)]	We provide emission share from food loss and waste for this.
38379	22	20	22	22	Can the point about food loss and waste be quantified? That would be much more informative. [, United States of America]	We provide more information here.
22115	22	20	22	22	B5.6-Please check and kindly address: Taking minimalistic approach in consuming food stuffs to avoid loss and food waste can help reduce GHG emissions as well as provision for food for the underprivileged. [Suvadip Neogi, India]	Many thanks. Due to limited space, we did not include this discussion.
29759	22	20	22	22	Indigenous food system management could be acknowledged here where food loss and waste reduction is an in-built component of sustainable stewardship. [Tanya Smith, Canada]	Due to limited space, we did not mentioned these details.
8229	22	21	22	22	Could the potential be indicated? For example Chapter 5, p 75 8-18 and chapter 6 page 46 table 6.5 [Harold Leffertstra, Norway]	We provide more information here and also mentioned the potential.
12607	22	22	22	22	Suggested addition at the end of the paragraph: The land sparing potential of food loss and waste prevention is also significant, and food loss and waste prevention is therefore an important enabler of CDR techniques such as afforestation and reforestation [Carina Millstone, United Kingdom (of Great Britain and Northern Ireland)]	Due to limited space, we did not mention this discussion.
12609	22	22	22	22	Suggested new paragraph: Given the significant contribution demand-side measures could make to greenhouse gas mitigation and land sparing, enabling the implementatino of CDR techniques, it is important that demand-side measures are considered alongside supply-side measures in climate benefits provided in agriculture and land use measures. For example, demand-side measures should be included in Nationally Determined Contributions under the Paris process, or the prevention of food loss as part of climate finance from high to low income countries. In general, the principles of contraction and convergence must apply to dietary change: a contraction in high-carbon diets in industrialised, high-income countries, that would enable some meat consumption in low-income countries, converging in a largely plant based global diets, with animal-source products limited to meat and eggs produced on livestock from feed that does not compete directly with arable land for human edible crops. [Carina Millstone, United Kingdom (of Great Britain and Northern Ireland)]	Due to limited space, we did not mention this discussion.
12629	22	22	22	22	Suggestion to add another paragraph: B.5.7. Global population growth is putting increasing pressure on land and other resoures.. Ensuring women are able to choose the size of their families, through increased educational opportunities for girls and professional opportunities for women, as well as universal access to family planning is therefore an essential, critical demand-side measure for climate mitigation and adaptation through the food system. Pathways to a sustainable food system assume population stabilisation, with fertility rates at replacement level by 2050 (world Resources Institute 2018, Creating a Sustainable Food Future) [Carina Millstone, United Kingdom (of Great Britain and Northern Ireland)]	This is out of the scope of this report.
8231	22	22	22	22	The reference to Figure SPM 7 seems wrong since it has no information about food loss and waste. [Harold Leffertstra, Norway]	We removed the reference to the figure.
11653	22	31	22	31	what are the sugestionz for limiting dairy products? Oat, soy etc. The industry is already starting to emphasizet this without paying attention to its real effect on health. [Linah Ababneh, Sweden]	Due to limited space, we did not mention this discussion.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
223	22	8	23	7	This section on diet change and in other places, estimates are provided on emission reductions that could happen with diet changes. There are two problems with this analysis. First, the health impacts of the diet changes are hotly disputed in the literature and change almost on a monthly basis. The writing needs to soften the claims that the emission reducing diet changes increase health. Second, there is zero discussion of how (what policy changes) the diet changes could happen. Persuasion will not do it. High emission diets would have to be made more expensive, and that is never mentioned. [Wallace Tyner, United States of America]	We modified the statement and highlight the role of "healthy and sustainable diets" in climate change mitigation. We did not discuss about the policies here due to limited space.
24591	22	10	23	14	Terms such as 'healthy' or 'Mediterranean diets' should be avoided - rather, provide details on underlying foods being considered [, Ireland]	We provided a details on what we mean by sustainable and healthy diet.
18323	22	2			The mitigation potential for agroforestry (4.27-21.5 GtCO ₂ eq/yr) doesn't seem to be consistent with what is indicated in figure SPM6 [Edouard Davin, Switzerland]	To shorten the section, we remove the description of agroforestry.
23267	22	3			Change 'increasing resilience to' with 'adapting to' and change 'There are many alternative pathways that can increase resilience including' with 'There are many alternative adaptation pathways including' [Mark Howden, Australia]	Here, we focused on resilience thus we kept our initial version. However, we removed the latter section of the text.
15909	22	8			ok! [Caroline Vincke, Belgium]	Many thanks.
2103	22	9			Robust Evidence/high agreement [Tomas Molina, Spain]	We changed the confidence level to medium one.
23269	22	12			The use of 'healthy' here and elsewhere implies that the alternative diets listed are 'unhealthy' (and there is good evidence to the contrary in relation to the Mediterranean diet). This needs either a new name or at the least placed into inverted commas. The terminology etc of the different categories also is confusing – following the logic of the text, why should a diet with 'limited meat and dairy' be more mitigation-friendly than a vegetarian one? [Mark Howden, Australia]	We provided a definition of sustainable and healthy diet.
2105	22	14			Robust Evidence/high agreement [Tomas Molina, Spain]	We provided here medium level confidence.
16477	22	15			This part should be explained more. Land use change problem from red meat consumption is very important and have one of the key solutions for land degradation. [, Republic of Korea]	Many thanks. This statement is removed.
16479	22	19			'tested' would be like to change 'testing'. [, Republic of Korea]	Many thanks. This statement is removed.
12995	23	1	23	1	Fig SPM7- this is not an intuitive definition of a vegetarian diet and may invite ridicule from the press. Consider revising. [Aidan Farrell, Trinidad and Tobago]	Figure SPM7 was removed from the SPM
30131	23	1	23	1	Figure SPM 7 does not seem to be consistent with figure SPM 6. For example grazing land management in figure SPM 7 has a potential of 0.25 to about 1.6 GtCO ₂ eq, while in figure SPM 6 "pasture management" counts up to only 0.31 to 0.43 GtCO ₂ eq [, Netherlands]	Figure SPM7 was removed from the SPM
30137	23	1	23	1	It should be indicated for what period the mitigation potentials apply. In section 5.5.1 it is indicated supply-side mitigation estimates are based on cropland and grassland area projections for 2030. As indicated in section 5.5.2 and statement B5.4 the demand-side mitigation options refer to 2050. [, Netherlands]	Figure SPM7 was removed from the SPM
30209	23	1	23	1	Why only mitigation potentials for cropping system potentials are given and not also for livestock systems? The supply side consists of both. [, Netherlands]	Figure SPM7 was removed from the SPM
20883	23	1	23	1	It is unclear whether the figures expressed in the table are in reference to the average current global diet, or a different reference case - this should be explained. [, United Kingdom (of Great Britain and Northern Ireland)]	Figure SPM7 was removed from the SPM
38381	23	1	23	1	The use of the term "Healthy Diet" implies that the other diets mentioned are not healthy. Another term should be used. [, United States of America]	Figure SPM7 was removed from the SPM

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
38383	23	1	23	1	Why does the pescetarian bar contain no error bars? [, United States of America]	Figure SPM7 was removed from the SPM
8611	23	1	23	1	What does mean "root phenotype" in this context ? [Marc Aubinet, Belgium]	Figure SPM7 was removed from the SPM
17427	23	1	23	1	The graph might be read as 'the IPCC prefers flexitarian diets over vegetarian diets in climate mitigation'. Is this the intention? Please clarify what the intended big picture message here is. And what about vegan diets? [Taehyun Park, Republic of Korea]	Figure SPM7 was removed from the SPM
27681	23	1	23	2	Figure SPM.7: This figure is highly misleading because it implies that with biochar most of the problems are solved and that is the most effective solution (and it might prevent the effort needed for sustainable agriculture). It does not communicate how really uncertain this technology is and that there could be negative side effects (that are yet unknown, see our comments on chapter 5). We suggest at least putting a disclaimer or give the biochar-bar a different colour. Otherwise the interpretation of this figure might be imply very negative outcomes for a sustainable land management. [, Germany]	Figure SPM7 was removed from the SPM
27683	23	1	23	2	Figure SPM 7: "Rate per Hectares ... KT CO2 eq ..." - do you mean metric ton per hectare (instead of kilo ton)? [, Germany]	Figure SPM7 was removed from the SPM
20881	23	1	23	2	The names of these could be altered to avoid misinterpretation - for example, flexitarian is generally considered to mean a 'flexible vegetarian' without dairy implications, which could lead to confusion about why it has a higher mitigation potential than a vegetarian diet, so could be replac with 'Climate vegan' or 'Reduced meat and dairy'. Similarly, naming one the 'Healthy diet' suggests that the others are not healthy. The descriptions below the names should be revised to make them more intuitive - for example, the current figue shows that 'limited sugar, meat and dairy' (healthy diet) gives a lower mitigation potential than 'limited meat and dairy' alone (flexitarian), suggesting that higher sugar consumption helps to mitigate climate change. [, United Kingdom (of Great Britain and Northern Ireland)]	Figure SPM7 was removed from the SPM
32397	23	1	23	2	In line with the findings of Chapter 2 (esp. 2.7.1.2.1) and Chapter 5 (5.4.6) it is important to list the GHG mitigation potential of strictly vegetarian and vegan diets as well, especially as a switch to vegan diets has become one of the most popular individual climate change mitigation approaches amongst, especially, West European consumers. (see for example https://www.theguardian.com/lifeandstyle/2018/apr/01/vegans-are-coming-millennials-health-climate-change-animal-welfare) [Simone Lovera-Bilderbeek, Paraguay]	Figure SPM7 was removed from the SPM
23079	23	1	23	7	Fig. SPM 7: The provided ranges of technical potentials are likely to lead to wrong conclusions because they suggest that there is potentially a lot of possible mitigation in biochar or root phenotypes. Eg: where would the biomass for the biochar come from and how is the energy consumption of pyrolysis taken into account? On the other hand, restoration of degraded lands and reclamation of organic soils are highly effective and cheap. It's the economic and realistic potentials we need. The authors could give estimates of cost ranges and possible barriers to scaling up to complement the information. [Anastasios Kentarchos, Belgium]	Figure SPM7 was removed from the SPM

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
23081	23	1	23	7	The measures need to be reviewed and presented differently. Demand-side measures are likely to limit land demand, but supply side measures are likely to require more land (as most of them reduce output per unit land area). It would be good to show how overall land available for food production would change. Supply-side measures are also counter-intuitive, as largely speculative and unproven measures (biochar, root phenotype) dominate, and it is unclear where the biomass for biochar would come from. [Anastasios Kentarchos, Belgium]	Figure SPM7 was removed from the SPM
13135	23	1	23	7	Figure spm7. first panel. This seems to be inconsistent with figure SPM7. I suggest it could be ommitted. [David Cooper, Canada]	Figure SPM7 was removed from the SPM
14593	23	1	23	7	Figure SPM7. The Demand Side Mitigation should include sub-categories such as 'food loss and waste' and 'soil, water and biodiversity conservation' [, Canada]	Figure SPM7 was removed from the SPM
27685	23	1	23	7	Figure SPM.7: Please clarify: Does this figure really give the mitigation potential of the diet types (the reduction of overall emissions), and not the emissions of the respective type of diet? [, Germany]	Figure SPM7 was removed from the SPM
27687	23	1	23	7	Figure SPM.7 does not reflect the entire discussion of chapter 5.2.2. There is clear evidence that diets without any animal products (vegan) lead to the highest GHG reduction compared to any other diet as reported in 5.2.2.1. Such vegan diets should also be displayed in this figure. Furthermore it would be helpful to clearly define the differences of the diet categories (e.g. the reader might be confused why a flexitarian (normally meat/fish to some occasions) diet is less carbon intensive than a vegetarian diet (normally without any meat), or why one diet in particular is tagged healthy). In particular, the term "Flexitarian" might be understood in various forms of diets and should be rather not used. Also, it is not clear what "limited meat and dairy" means compared to "meat/seafood once a month". Please revise the figure accordingly. [, Germany]	Figure SPM7 was removed from the SPM
24597	23	1	23	7	Issues with biochar, including sources of biomass and potential adverse impacts on soils, need consideration. Restoration of degraded lands should have a higher profile as being a key win-win for mitigation and adaptation [, Ireland]	Figure SPM7 was removed from the SPM
24681	23	1	23	7	SPM7 unclear on why soil carbon sequestration in agriculture is not included in the supply for this figure? [, Ireland]	Figure SPM7 was removed from the SPM
3963	23	1	23	7	Figure SPM 7: Express areas in square km (km**2) instead in ha. The last IPCC report (SR1.5) has adopted the practice of expressing areas in square km (km**2). [, Switzerland]	Figure SPM7 was removed from the SPM
38385	23	1	23	7	Figure SPM 7 could be made much stronger with a simple fix. The two panels in this figure have very different axes (0-1.75 vs. 0-7) but many readers will not notice this difference in the side-by-side panels, and will not realize that the demand-side mitigation measures offer much greater potential gains than the supply-side measures. This point has gradually gained traction in the literature, including IPCC reports, over the past decade and this report should amplify that finding rather than unintentionally obscuring it. The two panels appear elsewhere in the report as well (Chapter 5), but not side-by-side. The axes should be the same on the two panels, especially when they appear together in the SPM. The main point then is that attention to demand-side (vs. supply-side) measures is more important than deciding among the available supply-side measures (where a lot of attention has gone in the past). [, United States of America]	Figure SPM7 was removed from the SPM

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
38387	23	1	23	7	In the panel on the left, the potential for biochar is overestimated. Although the report cites appropriate literature, the evidence for biochar as a mitigation measure is actually quite weak, with very few in-situ experiments carried out globally. [., United States of America]	Figure SPM7 was removed from the SPM
38389	23	1	23	7	This figure is too detailed for inclusion in the SPM. The SPM is far longer than the target length. [., United States of America]	Figure SPM7 was removed from the SPM
24705	23	1	23	7	The problem in SPM Fig 7 on p. is that the individual studies show GHG abatements that are much dependent on the context - what is the initial diet, diet change; how the food is produced in the initial situation and how food is produced after the diet change - as well as on the definition of "flexible diet". The definition of "flexible diet" in the study of Hedenius et al. (2014) is in fact rather demanding: 75% of meat/dairy replaced with pulses/cereals. If *all meat* and *all dairy products* are replaced by cereals and pulses in the diet this is in fact a rather big change in the diet and it is understandable that relatively large GHG abatement may be implied. However "upscaling" the GHG abatements to the global level based on individual studies cannot provide results of "high confidence". Thus one could say that the report is rather optimistic, interprets/upscals the results of individual studies to global level too easily, and brings this optimism to the summary for policy makers. One could at least downgrade the confidence level of the statements. However one should not say there are serious flaws in the document. Surely when implementing such production practices -where feasible - one may reach significant results in GHG abatement and various environmental benefits. They are of course important to be brought up in this kind of document. [Heikki Lehtonen, Finland]	Figure SPM7 was removed from the SPM
29273	23	1	23	7	I suggest avoiding using aggregated emission. Much better to give information by gas. Aggregating two so fundamentally different gases as CO2 and CH4 is highly problematic. And you do not even state which GWPs you have used for this. [Jan Fuglestedt, Norway]	Figure SPM7 was removed from the SPM
12935	23	2	23	2	Fig SPM7: There is no agreed conversion to generate GtCO2eq per year (note B5.2 and B5.4 write the units as "GtCO2eq yr-1"). For instance the methane metrics in IPCC AR5 WG 1 table 8.7 vary by a factor of 20. It would be more scientifically accurate if CO2, methane and N2O mitigation were quoted separately, rather than aggregating them in the controversial CO2eq. [William Collins, United Kingdom (of Great Britain and Northern Ireland)]	Figure SPM7 was removed from the SPM
24441	23	3	23	7	Cropland management is a vague term. It could mean many things. We think that it should be explained somewhere so that one can understand the measures that needs to be taken to benefit from this potential. [., Belgium]	Figure SPM7 was removed from the SPM
30139	23	3	23	7	We suggest to add that the range of the mitigation options is related to C-pricing and the max technical potential, as also indicated in the caption of figure 5.12: " Ranges given in units of total Pg CO2-eq/yr represent varying adoption rates as a function of C pricing (USD20, USD50 and USD100 per Mg CO2-eq), to a maximum technical potential—that is, the full implementation of practices on the available land base." [., Netherlands]	Figure SPM7 was removed from the SPM
3043	23	3	23	7	'pescetarian' diet also includes river fish, not seafood only [., Russian Federation]	Figure SPM7 was removed from the SPM
33099	23	3	23	7	Figure SPM.7 is interesting but hard to understand, especially on the demand side. What is illustrated? Is it an amount of CO2 that is avoided if everyone in the World adopts the given food regime? Given the amounts of potentially avoided emissions, it is important to keep and clarify this panel. [Philippe Marbaix, Belgium]	Figure SPM7 was removed from the SPM

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
17613	23	5	23	5	Suggest replacing "This will require..." with "These could involve..." [, Sweden]	Figure SPM7 was removed from the SPM
20887	23	figure SPM7	23	figure SPM7	The inclusion of meat and fish in the vegetarian diet needs explanation. Additionally, could a vegan category be added? [, United Kingdom (of Great Britain and Northern Ireland)]	Figure SPM7 was removed from the SPM
20885	23	1			In diagram, consider rephrasing vegetarian - I'm sure vegetarians will be upset that includes meat or fish once a month! [, United Kingdom (of Great Britain and Northern Ireland)]	Figure SPM7 was removed from the SPM
25993	23	2			We believe that this figure is relevant and justified, but we consider that it is currently subject to several defects that must be corrected. In particular: <ul style="list-style-type: none"> • We suggest producing a new figure based on the findings of the SRCCL rather than using an existing figure from an isolated scientific article. In this new figure IPCC could define its own diets based on the WHO recommendations and calculate their effects, and present them compared to the actual diets in different regions of the world. • We suggest to improve consistency between Figure SPM-6 page SPM-20 (also Figure 2.32 page 2-95) and Figure SPM-7 page SPM-23 (also Figure 5.14 page 5-69) and to clarify the information you wish to provide with these figures. Considered together, these figures are currently very confusing. • If the actual figure is kept, we suggest to check all the diets definitions. Vegetarian does not include meat or seafood in the diet in the usual meaning; healthy diet is not clearly defined; and climate carnivore is not widely used and not recognised. • We suggest to add, in the figure and/or in its caption, the health effects of these diets, the associated costs to society, the WHO recommendations and deviations from current diets. • We suggest to use only one figure for food systems including agriculture, with their mitigation potential, the area of potential adoption, the mitigation per hectare, some details on the practices and clear reference to where in the report there is real detail (what is behind the measures and the effect on the challenges of the different ways to understand the measures). • To be consistent with Figure SPM-4 page SPM-14 (also Figure 1-4 page 1-33) and Table SPM-1 page SPM-17, we suggest to include also value chain options and risk management options. • Waste recycling should be used instead of biochar alone. See also GENERAL COMMENT ON BIOCHAR. • Agroforestry and agroecological practices should be added in the supply-side mitigation options. See also GENERAL COMMENT ON FIGURES. [, France] 	Figure SPM7 was removed from the SPM
32939	23				How have these been chosen? Seems an odd choice. Listing root phenotype and not listing agroforestry? On the demand side -- vegetarians don't eat meat and seafood. It's not for IPCC to redefine what vegetarian is -- it means no animals in the diet. Meat/seafood once a month is a flexitarian. Is there a reason to leave vegan off this list? [Doreen Stabinsky, United States of America]	Figure SPM7 was removed from the SPM
23763	23				demand side mitigation. Vegetarian is defined as those who consume meat/seafood once a month! Most vegetarians don't consume either meat or seafood as in India [, India]	Figure SPM7 was removed from the SPM
16481	23				please add "A" and "B" in Figure SPM 7. [, Republic of Korea]	Figure SPM7 was removed from the SPM
23271	23				On the 'Demand' side, why aren't food losses and waste there? The chapter text tells us how important this is. [Mark Howden, Australia]	Figure SPM7 was removed from the SPM
17823	23				This figure is very useful but it would be extremely helpful to add an indication whether the contributions can be added or not, as for Fig SPM6. Also, what is the baseline considered for supply side and demand side options? [Quentin Lejeune, Germany]	Figure SPM7 was removed from the SPM

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
3965	24	1	24	1	Write: "Enabling climate land-related mitigation and adaptation ..." [, Switzerland]	Thank you. This comment has been taken into account in the revisions process.
8805	24	1	24	1	Shouldn't it read "Enabling climate change mitigation and adaptation strategies ..."? [Jean-Luc Chotte, France]	Thank you. This comment has been taken into account in the revisions process.
25995	24	1	24	2	All this section C is very well written and should be conserved as much as possible. [, France]	Noted. Thank you.
23085	24	4	24	7	C1 headline statement * Why is mitigation not included? Surely this can, and must, be aligned with combatting degradation and desertification. * Is it even meaningful to distinguish between combatting land degradation (in a changing climate) and adapting to climate change? Isn't one merely a subset of the other? See higher level comments and comments on section A. This report needs to take a transparent and consistent approach to distinguishing between the issue of general pressures on land and use, and the specific contribution of climate change. [Anastasios Kentarchos, Belgium]	Accepted. Statement revised. Consideration of both adaptation and mitigation while combatting land degradation and desertification now included. Report highlights the different pressures on land and land use, including the specific contribution of climate change (see Part A of the SPM).
25039	24	4	24	7	How to identify or monitor Sustainable land management (SLM) approaches in the context of climate change. Without such a clarify the suggestion has little implication; [Binaya Shivakoti, Japan]	Accepted. The importance of monitoring is now highlighted in Section D.
6343	24	4	24	7	The language from C1 could be replaced by that from C5.1, which is even more informative as it clearly states that all of the land-related challenges tackled in the report (Mitigation, Adaptation, Food Security, Land Degradation, Desertification) can theoretically be solved. Moreover, C1 does currently not mention co-benefits of sustainable management practices for mitigation, whereas they are mentioned in C1.4 and C1.5. This should be corrected [, Gambia]	Partially accepted. All statements in Section C now revised and restructured.
24599	24	4	24	7	Mitigation should be included in the heading, e.g., ending as "aligned with climate change adaptation and mitigation" [, Ireland]	Accepted. Headline Statement now includes mitigation
26263	24	4	24	7	Please specify if the findings of this section apply to all regions of the word or highlight regional differences. [, Luxembourg]	Thank you. This comment has been taken into account in the revisions process, where the literature specified in the underlying chapters and where space allows.
33943	24	4	24	7	Please consider to specify how improved land use efficiency are defined. Is this based on productivity (yield/unit area) or ecosystem functioning or both? [, Norway]	Noted. Statement now completely revised and restructured.
6133	24	4	24	7	It would be better to write "Sustainable land management approaches can help combat land degradation and desertification, improve land use efficiency, deliver economic benefits, minimise conflict around land and biomass use at the local level, and can be aligned with climate change adaptation measures and policies (medium confidence). {4.10.2, 4.10.4, 7.7.2}" [Jacques-Andre Ndione, Senegal]	Noted. Text has been revised and restructured.
17825	24	4	24	7	C1 should include a reference to mitigation [Quentin Lejeune, Germany]	Accepted. New Headline Statement includes reference to mitigation.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
26089	24	4	24	7	This weak summary, stated with medium confidence, should be significantly revised to reflect the stronger statements in the Report: For example: "Site-specific technological solutions, based both on new scientific innovations and indigenous and local knowledge, are available to avoid, reduce and reverse desertification, simultaneously contributing to climate change mitigation and adaptation (high confidence)." (Chapter 3 at p. 6, lines 24-26) Similarly: "Land degradation can be addressed successfully in most cases by implementation of Sustainable Land Management (SLM) (very high confidence)." (Chapter 4 at p. 4, lines 16-17) And this from Chapter 5: "Supply-side mitigation practices in the food system can contribute to climate change solutions by sustainably and efficiently intensifying the use of land and sequestering carbon in soils and biomass." (p. 5, lines 26-28) [Reid Detchon, United States of America]	Partially accepted. Section restructured and content changed. Statements from underlying chapters rephrased and incorporated into headline statements B5 (statement from chapter 3) and B7 (statement on food system).
22117	24	4	24	7	C1-Kindly check: 'Sustainable land management approaches'....what are the approaches? Is SLM the combination of all the conventionally available land management options? It should be addressed properly. [Suvadip Neogi, India]	Accepted. Sustainable Land Management (SLM) approaches are outlined in all parts of the SPM. Section B in the new draft now includes a statement on SLM practices. Enabling conditions are expanded in Sections C and D.
28299	24	4	24	12	Land degradation neutrality (LDN) entails integrated multiple response options for SLM, food production systems and mechanisms for avoiding, reversing and restoring degraded lands. Replacing SLM with LDN as the policy intervention provides an integrated mechanism for addressing sustainable land management, food security, land degradation and desertification challenges in the most comprehensive and cost effective manner. It is proposed that SLM is replaced with LDN [Barron Joseph Orr, Germany]	Partially accepted. Parts C and D includes statements on Land Degradation Neutrality (LDN) and integrating multiple response options. The mandate of the Special Report includes an assessment of Sustainable Land Management (SLM), and so it is a key concept in the SPM.
8865	24	4	24	12	Land degradation neutrality (LDN) entails integrated multiple response options for SLM, food production systems and mechanisms for avoiding, reversing and restoring degraded lands. Replacing SLM with LDN as the policy intervention provides an integrated mechanism for addressing sustainable land management, food security, land degradation and desertification challenges in the most comprehensive and cost effective manner. It is proposed that SLM is replaced with LDN [Jean-Luc Chotte, France]	Partially accepted. Parts C and D includes statements on Land Degradation Neutrality (LDN) and integrating multiple response options. The mandate of the Special Report includes an assessment of Sustainable Land Management (SLM), and so it is a key concept in the SPM.
29951	24	4	24	33	This all sounds very good, but what are these practices that were considered for forming these statements and should be implemented? [, Estonia]	Accepted. Sustainable Land Management (SLM) approaches are outlined in all parts of the SPM. Section B in the new draft now includes a statement on SLM practices. Enabling conditions are expanded in Sections C and D.
20889	24	4	24	33	The distinction between 'sustainable land management approaches', 'sustainable land management practices' and 'land management response options' is not entirely clear and should be clarified. [, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Terms have now been harmonised.
38391	24	4	24	33	The headline statement refers to adaptation and mitigation responses but the subbulleted statements do not provide additional details distinguishing between options relevant for the two processes. [, United States of America]	Noted. Section restructured and content changed.
24241	24	6	24	6	The wording "can be aligned" looks too weak to link SLM to climate change adaptation. It may need to be changed to "must be aligned". [Kamal Djemouai, Algeria]	Noted. Text has been revised and restructured.
24601	24	8	24	8	Would suggest food production and ecosystems services for mitigation and adaptation be included here, otherwise this is a very generic statement [, Ireland]	Noted. Statement now completely restructured and revised.
817	24	8	24	11	this paragraph does not include any confidence level. Either it is added or the paragraph should be deleted. [, Spain]	Accepted. All paragraphs now include confidence statements.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
22119	24	8	24	11	C1.1-Kindly check: multiple response options.....For what? For Climate change mitigation or adaptation? Or both? Climate mitigation is a strategy to address climate change by reducing greenhouse gas emissions. Various options are available for both mitigation policy and technology measures, providing enough economic potential to offset the projected emissions growth. It is crucial for policymakers to be aware of possible side effects, such as co-benefits and interlinkages to adaptation, to pursue a cost-effective implementation pathway. Different policy instruments, especially economic incentives and regulatory approaches, are currently being applied. However, for its successful implementation it is critical to understand how land use decisions are made and how socio-economic forces in the future will influence this process. [Suvadip Neogi, India]	Noted. Text has been revised and restructured. Text is now more specific on the type of response options, as well as co-benefits and trade-offs. Statements include adaptation as well as mitigation options.
3045	24	8	24	22	Not much about climate change! [, Russian Federation]	Accepted. C1 and C2 have been revised, considering this point and updated in the second draft to emphasise focus on climate
7449	24	9	24	10	also add "rangelands" among the other sectors [tarig Ibrahim, Sudan]	Thank you. This comment has been taken into account in the revisions process.
25997	24	12	24	13	Aren't they many ecosystem services, and then a "S" is required at the end of the word "service"? [, France]	Noted. Edit corrected in second draft.
23087	24	12	24	15	Numbers appear high. [Anastasios Kentarchos, Belgium]	Thank you. This comment has been taken into account in the revisions process.
7275	24	12	24	15	Are there regional differences? Which region is set to benefit the most? [Debra Roberts, South Africa]	Thank you. This comment has been taken into account in the revisions process, where the literature specified in the underlying chapters and where space allows.
29949	24	12	24	15	Not all of these services are currently included in the conventional GDP calculations. This should be made very clear here that GDP is used purely for a comparison. [, Estonia]	Thank you. This comment has been taken into account in the revisions process, in particular references to the chapters where more space and detailed discussion of the underlying literature is provided.
24603	24	12	24	15	This is a report on climate change, so it would be very important that carbon management benefits in areas such as reducing land degradation are to the fore, as well as other benefits including economic benefits. More clarity on the costs assessment should be provided [, Ireland]	Thank you. This comment has been taken into account in the revisions process, in particular references to the chapters where more space and detailed discussion of the underlying literature is provided.
4945	24	12	24	15	Switching the order of two sentences in C1.2 will make the meaning of this paragraph clearer, because it is not clear whether "these losses" in the beginning of the second sentence indicate the economic losses before minimized or the ones after minimized. If "these losses" indicate the former, it would be better to switch the order of the two sentences. [, Japan]	Accepted. Statement now revised to clarify meaning.
30145	24	12	24	15	Statement C1.2 claims an extremely high economic damage due to land degradation (10-17% of GDP per year!). However, this is just one example taken from section 7.4.1. Many more examples are given in this section showing much lower numbers. For example: "Annual costs of land degradation due to land use and land cover change are estimated to be about USD 231 billion per year or about 0.41% of the global GDP of USD 56.49 trillion in 2007" (page 7-30, lines 30-31). Also, it is not clear for what period in time these enormous losses will happen (today or at some point in the future??). A more general statement would be to indicate the overall consensus that "Most studies show increasing effects on GDP as global mean temperatures increase" (page 7-30 line 33) and "ample evidence suggests that the cost of inaction in mitigation and adaptation, as well as in land use, exceeds the cost of action in both individual countries, regions, and worldwide" (page 7-31, lines 21-23, where the last "inaction" has been changed into "action", see next comment). If the numbers in this statement remain, they should be put in context. [, Netherlands]	Thank you. This comment has been taken into account in the revisions process, in particular references to the chapters where more space and detailed discussion of the underlying literature is provided.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
33945	24	12	24	15	The information provided and quantified in this paragraph is valuable and important to us. However in its current form it is formulated in a way that creates many additional questions. It is not clear if this is written in a way that looks back on past practises or are looking into the future. Similarly, it is not clear if these quantified numbers are aggregated and based upon only adverse effects of climate change or has a broader context. [, Norway]	Thank you. This comment has been taken into account in the revisions process, in particular references to the chapters where more space and detailed discussion of the underlying literature is provided.
33947	24	12	24	15	C1.2 can be lifted up to bold. [, Norway]	Thank you. This comment has been taken into account in the revisions process.
16483	24	12	24	15	[Add the value of land] The global cost of lost ecosystem service values estimated to be USD 6.3–10.6 trillion/yr(4.2.2.). [, Republic of Korea]	Thank you. This comment has been taken into account in the revisions process, where the literature specified in the underlying chapters and where space allows.
6135	24	12	24	15	Authors highlighted with a lot interest the issue of world's GDP saying that " These losses are estimated at between USD 6.3 and 10.6 trillion annually, representing 10-17% of the world's GDP". Is it possible to go deeper in this analysis in case that we would like to learn mor abuit Africa and South America. How much lthese losses represent in Africa's GDP, in South Americ'as GDP? [Jacques-Andre Ndione, Senegal]	Thank you. This comment has been taken into account in the revisions process, where the literature specified in the underlying chapters and where space allows.
22121	24	12	24	15	C1.2-Kindly check: ecosystem service.....What are the services? Please specify the services in this current context. [Suvadip Neogi, India]	Thank you. This comment has been taken into account in the revisions process.
23089	24	12	24	22	These statements on the benefits of sustainable land management must be made relevant to the context of climate change or climate action. Does C1.1 intend to say that climate change induces ecosystem service decline (which can in turn be lessened by sustainable land management practices)? Does C1.2 intend to say that sustainable land management can double pasture land value even in the presence of climate change? Please provide examples of the most important sustainable land management practices (linking to previous SPM figures/ tables where applicable). Also, include the word "avoid" before "reverse" on line 12 [Anastasios Kentarchos, Belgium]	Thank you. This comment has been taken into account in the revisions process.
38393	24	13	24	15	The statement appears to rely on a single study. Is this confidence level justified? [, United States of America]	Thank you. This comment has been taken into account in the revisions process.
30143	24	15	24	15	Remove reference to section 1.4.1. In this section nothing is said about the economic losses of land degradation, which is the topic of statement C1.2. [, Netherlands]	Thank you. This comment has been taken into account in the revisions process.
25041	24	16	24	16	Current practices, which one. Does this mean there are no SLM in the whole world? [Binaya Shivakoti, Japan]	Accepted. Statement revised to be more specific on types of practices.
33949	24	16	24	16	Unclear what its meant by "current practices". There exist sustainable land management also today.. [, Norway]	Accepted. Statement revised to be more specific on types of practices.
25999	24	16	24	18	Explain what is meant by current practices, there are lots of very different current practices. [, France]	Accepted. Statement revised to be more specific on types of practices.
8233	24	16	24	18	The meaning of this sentence seems difficult to understand [Harold Leffertstra, Norway]	Noted. Text has been revised and restructured.
7277	24	16	24	22	An assessment of this bullet point is required. [Debra Roberts, South Africa]	Accepted. All statements now have confidence statements.
24605	24	16	24	22	Can some statements be given on the scale of land areas of pasture lands being considered? Also mention areas which are considered to be sustainably managed (if any?) and quantify impacts and savings [, Ireland]	Noted. Text has been deleted in the latest draft.
24607	24	16	24	22	Scale of drylands should be provided. Also, are these statements more widely applicable? Provide confidence levels [, Ireland]	Partially accepted. Text has been revised and now no longer refers to drylands. Uncertainty language has been added for all statements of the SPM.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
4947	24	16	24	22	We would suggest to rephrasing "can more than double" as it is not fully clear to non-native English speakers. If it means that sustainable land management can increase the economic value by a factor of two, we would like to clarifying whether the evaluation includes the cost of countermeasures or not. If it includes the cost, we also would like to have more explanation on why the sustainable land management has not been realized despite the economic value. [, Japan]	Partially accepted. Text has been deleted in the latest draft.
16485	24	16	24	22	This paragraph is hard to say general respond. There are many reverse outcomes and negative side effects with sustainable land management according to regions, levels, and sectors. So would be mentioned other side aspect shortly. [, Republic of Korea]	Partially accepted. Statement revised to include more detail on economic impact of sustainable land management globally.
13455	24	16	24	22	No confidence level ? [Lourdes Tibig, Philippines]	Accepted. Confidence levels now included.
22123	24	16	24	22	C1.3-Kindly check: Compared with current practices.....What is meant by current practices-conventional practices? Please mention. [Suvadip Neogi, India]	Accepted. Statement revised to be more specific on types of practices.
22125	24	16	24	22	C1.3-Please check: kindly provide confidence statement. [Suvadip Neogi, India]	Accepted. Confidence levels now included.
819	24	16	24	29	these paragraphs don't include any confidence levels. Either they are updated or the paragraphs should be deleted. [, Spain]	Thank you. This comment has been taken into account in the revisions process.
38395	24	16	24	29	C1.3 and C1.4 are missing confidence statements. The first sentence in C1.3 appears to rely on a single study. [, United States of America]	Accepted. Confidence levels now included.
26003	24	19	24	21	We suggest to rephrase as following: "Agroecology, with innovative combinations of indigenous and local knowledge and modern agronomic practices, by relying on biochemical cycles and by a sustainable use of biodiversity, can contribute to overcoming combined challenges of climate change and desertification" [, France]	Noted. Section structured and content changed
23091	24	20	24	20	"siltation". Why only "siltation" considering that this could also be interpret to only refer to a specific particle size (silt)? Rivers also transport other materials, including gravel, which are deposited in dams. Terms like "sedimentation" or "sediment deposition" could suit better. [Anastasios Kentarchos, Belgium]	Noted. Section structured and content changed
30839	24	21	24	22	greater clarity is required what the specific comparison is in terms of SLM vs. conventional. What combination of measures is it referring to. [Mike Morecroft, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Statement revised to be more specific on types of practices.
25043	24	23	24	23	Are all rangeland management and forestry practices fall under sustainable land management (SLM); if yes, how, if no, then how come they result in GHG sink and other positive outcomes. [Binaya Shivakoti, Japan]	Thank you. This comment has been taken into account in the revisions process through rewriting and rewording for clarification.
4949	24	23	24	23	The current SPM states that both "Rangeland management and agroforestry practices result in increased carbon sequestration, reduced soil erosion and improved soil and water conservation", while Chapter 3 (P3-6, Line 34~39) suggests only the effects of Agroforestry, and doesn't mention "Rangeland management" as an activity with these effects. Therefore, we would suggest clarifying the relationship regarding "Rangeland management" and Agroforestry. [, Japan]	Thank you. This comment has been taken into account in the revisions process.
6053	24	23	24	23	SFM should be added after rangeland management. Forest was previously indicated as the third largest mitigation potential option. [, Poland]	Thank you. This comment has been taken into account in the revisions process.
20891	24	23	24	23	should this say 'sustainable rangeland management...'? [, United Kingdom (of Great Britain and Northern Ireland)]	Thank you. This comment has been taken into account in the revisions process.
30841	24	23	24	23	What is the comparison? What causes an increase compared to what baseline? [Mike Morecroft, United Kingdom (of Great Britain and Northern Ireland)]	Thank you. This comment has been taken into account in the revisions process, in particular references to the chapters where more space and detailed discussion of the underlying literature is provided.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
23273	24	23	24	29	It is not true to say that 'Rangeland management and agroforestry practices result in carbon sequestration' etc. There are plenty of such practices that demonstrably don't. It would be correct to say 'these practices can' have those results. BUT that raises the bigger question as to why such practices are not currently used and what it would take to make them used. [Mark Howden, Australia]	Thank you. This comment has been taken into account in the revisions process.
22127	24	23	24	29	C1.4-Please check: Grasslands and forestry also help sequester soil carbon. Introduction and adoption of conservation agriculture is also relevant. Conservation Agriculture is a farming system that promotes maintenance of a permanent soil cover, minimum soil disturbance (i.e. no tillage), and diversification of plant species. It enhances biodiversity and natural biological processes above and below the ground surface, which contribute to increased water and nutrient use efficiency and to improved and sustained crop production. [Suvadip Neogi, India]	Thank you. This comment has been taken into account in the revisions process.
2033	24	25	24	25	If UK English, it should be "programmes". [William Lahoz, Norway]	Accepted. Will be addressed in copy-edit.
15321	24	27	24	27	Suggest replace 'electricity' with 'renewable energy sources'. [, Australia]	Thank you. This comment has been taken into account in the revisions process.
33951	24	27	24	27	Unclear what is meant by "traditional biomass use". [, Norway]	Thank you. This comment has been taken into account in the revisions process, in particular references to the chapters where more space and detailed discussion of the underlying literature is provided.
15259	24	27	24	29	There needs to be a clearer differentiation throughout the report between heavily regulated industrial biomass use and unregulated use of biomass for domestic heat and energy. The future role of BECCS and potential feedstock impacts are very different from the pressures and impacts caused by 'traditional use'. The report should put both extremes into context in terms of scale, regulation, sustainability impacts and future role. The sustainable use of biomass with carbon capture has been identified as playing a potentially vital role in a low carbon economy https://www.theccc.org.uk/wp-content/uploads/2018/11/Biomass-in-a-low-carbon-economy-CCC-2018.pdf [Andrew Dugan, United Kingdom (of Great Britain and Northern Ireland)]	Partially accepted. The potential of biomass use to bioenergy and BECCS has been assessed in the cross-cutting box on bioenergy. The constraints of biomass potential and sustainable constraints depending upon specific context and technology applied have also been detailed in Chapter 6.
26001	24	27	24	29	Please detail what are modern fuels : solar energy and biogas or hydro-energy, solar and wind energy as both are reported separately in 3.7.3.1.? [, France]	Thank you. This comment has been taken into account in the revisions process, in particular references to the chapters where more space and detailed discussion of the underlying literature is provided.
24609	24	27	24	29	Can some estimates be given on the scale of mitigation that can be provided? [, Ireland]	Thank you. This comment has been taken into account in the revisions process, in particular references to the chapters where more space and detailed discussion of the underlying literature is provided.
7451	24	27	24	29	please also add "reduces in door air pollution" (the associated health consequences may affect the ability of the community to adopt appropriate land management options) [tarig Ibrahim, Sudan]	Thank you. This comment has been taken into account in the revisions process, in particular references to the chapters where more space and detailed discussion of the underlying literature is provided.
15709	24	27	24	29	This is too complex for me to understand. What are the modern fuels here? And what is the traditional biomass use? These things are region specific but here I get feeling this implicitly refers to developing countries and biomass burning in simple stoves. [Tuomo Kalliokoski, Finland]	Thank you. This comment has been taken into account in the revisions process, in particular references to the chapters where more space and detailed discussion of the underlying literature is provided.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
2155	24	30	24	33	The reference here to insecure property rights is well described when referring to individual land holdings and activities that require investment, such as reforestation or agroforestry. The dynamic with secure collective property rights leading to avoided deforestation is different, is empirically significant, and provides low-cost benefits. Again it merits a separate specific reference. [David Kaimowitz, Nicaragua]	Thank you. This comment has been taken into account in the revisions process.
33953	24	30	24	33	Please consider to also refer to barriers for implementation in the SPM. A number of interconnected barriers and bottlenecks are listed in Section 4.10.4 "Barriers to implementation". [, Norway]	Thank you. This comment has been taken into account in the revisions process.
33955	24	30	24	33	C1.5. This can be presented as a positive opportunity and clear policy advice, instead of as a problem. Based on the content of the paragraph, one clear and useful policy advice could be: "Securing property rights to land and providing access to credit and agricultural advisory services as well as capacity building at local and community levels, may provide private incentives to promote sustainable land management practices." [, Norway]	Thank you. This comment has been taken into account in the revisions process.
32399	24	30	24	33	This statement fails to acknowledge other socio-economic factors, including the role of subsidies and other perverse public incentive schemes, which include perverse market pressures due to inadequate regulations and lack of law enforcement, and the role of marketing and other corporate-driven agricultural advice and information that prioritizes profit-making over sustainable land management. See for example https://globalforestcoalition.org/wp-content/uploads/2018/11/incentivising-deforestation-for-livestock-products.pdf . It also fails to properly reflect the findings about market-based mechanisms in Chapter 1. [Simone Lovera-Bilderbeek, Paraguay]	Thank you. This comment has been taken into account in the revisions process.
25045	24	31	24	31	Again what are many sustainable land management (SLM); SLM could be defined but classifying a particular land management as sustainable is not straightforward hence not a good suggestion in the context of climate change. [Binaya Shivakoti, Japan]	Accepted. Sustainable Land Management (SLM) approaches are outlined in all parts of the SPM. Section B in the new draft now includes a statement on SLM (B6), outlining elements of SLM. Enabling conditions for SLM are expanded in Sections C and D.
23095	24	32	24	32	include "gender dynamics" [Anastasios Kentarchos, Belgium]	Thank you. This comment has been taken into account in the revisions process.
12611	24	33	24	33	Suggested addition at the end of the paragraph: as well as difficulties of developing viable business models for practices such as agroforestry. [Carina Millstone, United Kingdom (of Great Britain and Northern Ireland)]	Thank you. This comment has been taken into account in the revisions process.
6875	24	33	24	33	Add a sentence: "Support to sustainable land management through removal of these barriers represents one of the most important no-regret options in climate change mitigation and adaptation". [Markus Giger, Switzerland]	Thank you. This comment has been taken into account in the revisions process through rewriting and rewording for clarification.
3967	24	34	24	34	Write: "Governance providing for collaboration between multiple institutions ...". [, Switzerland]	Noted. Paragraph has been substantially rewritten.
25047	24	34	24	36	Implementing sustainable land management (SLM) without knowing/seeing a SLM is not useful recipe. [Binaya Shivakoti, Japan]	Accepted. The SPM has been rewritten so SLM is better defined.
30245	24	34	24	36	An effective system of extension services is crucial to fuel transformative change towards SLM. Many of the extension services has been dismantled in the past, and has to be established again. [, Netherlands]	Noted. Extension services are an important policy response covered in chapter 6 and many other chapters.
28301	24	35	24	36	replace SLM with LDN policies [Barron Joseph Orr, Germany]	Rejected. SLM and LDN are different policies.
8867	24	35	24	36	replace SLM with LDN policies [Jean-Luc Chotte, France]	Rejected. SLM and LDN are different policies.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
4951	24	37	24	40	Concerning the phrase "sustainable development principles", there seems to exist no "principle" that is agreed widely ("principle" reminds us of a very strong norm). The sustainable development principles here may be used to correspond to one of the Shared Socioeconomic Pathways (SSPs), the sentence "(...) can strongly reduce the vulnerability and exposure of human and natural systems to climate change" is a tautology. In other words, the SSP1 scenario is by its nature made as such scenario, however, it is unknown whether such principles "can reduce (...)" or not. Hence, the whole paragraph of C2.1 needs to be modified. [, Japan]	Accepted. Principles have been deleted and SSPs and other concepts further developed in SPM.
38397	24	37	24	40	C2.1 does not appear to be supported by the referenced section of the underlying report. [, United States of America]	Accepted. Sections are revised and references underlying section checked.
22129	24	37	24	40	C2.1-Kindly check: Modelled socio-economic pathways.....What does it target for? climate change mitigation or adaptation? Or both? The synergies and trade-offs of these two strategies revealed increasingly importance on reducing adverse climate effects. [Suvadip Neogi, India]	Accepted. Language surrounding SSPs and synergies and tradeoffs clarified in SPM.
3969	24	39	24	39	Write: "...and by implication reduce the risks ...". [, Switzerland]	Noted. Section has been substantially redrafted.
3047	24	41	24	41	suggestion: replace 'dynamically' with 'rapidly' [, Russian Federation]	Noted. section has been substantially redrafted.
3971	24	43	24	43	Write: "... availability of technology, knowledge and capacities." [, Switzerland]	Noted. Paragraph has been substantially rewritten.
40407	24		24		There is a need to strengthen the coherency with the SPM of SR15 in the approach of transitions (land, food; ethical, fair and just transitions) and transformation (CDRP). SLM is one element of a CRDP? [Valerie Masson-Delmotte, France]	Thank you. This comment has been taken into account in the revisions process.
3049	24	1	25	28	There is very low attention to climate in sections C1 and C2. [, Russian Federation]	Accepted. C1 and C2 have been revised, considering this point and updated in the second draft to emphasise focus on climate
7663	24	1	25	28	The nexus between land use and water management is silent in this section which seems extraordinary given their close dependencies in natural and managed systems. SPM would be enhanced by greater attention to water as an enabler and barrier to adaptation. [Judy Lawrence, New Zealand]	Accepted. SPM now includes more statements regarding land use and water management. Sections A and B also include statements on water, water scarcity, and land use-water interactions.
1597	24	4	25	28	Sustainable land management practices - [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	Rejected. This comment is linked to another comment.
1599	24	4	25	28	The UK government may formulate new legislation to encourage, or even possibly mandate, UK-based supermarkets to get their contractors & suppliers to practice more of the interventions you detail in sections C1. – C2.6. Here, the UK government might need to establish new collaborations between such business actors, develop a new policy mix (instruments & frameworks) and formulate new disaster & risk management plans, plus new adaptive management plans & approaches to tackle the problems you identify here. Here, the UK government could establish a permanent working group based in the Cabinet Office led by the Environment Minister to do so, along the lines of the Brexit 'no-deal' style preparations & arrangements, but for sustainable land management practices instead, to tackle this issue. [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	Rejected. Not applicable to the section.
22131	24	41	25	2	C2.2-kindly check: What are the complex risks? Please address. [Suvadip Neogi, India]	Noted. Section has been substantially redrafted.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
23097	24	41	25	16	<p>These statements are quite general and repetitive. Merely noting that there are complex socioeconomic influences and no quick-fix solutions is not so novel (and could be done in fewer sentences). Shortening these observations would allow more space to be devoted to what appear to be these sections' key insights. Namely:</p> <p>* that following existing good practices and international standards can advance sustainable land management and improve food security simultaneously as well as combatting desertification and contributing to mitigation and adaptation (C2.3). If this is true, please identify which are international good practices etc. that can accomplish these simultaneous goals. What is the relationship between this and Adaptive Management (C2.6 & Fig SPM8)?</p> <p>* that a target of 'land degradation neutrality' can be a useful framing device for bringing climate action and other socioeconomic and environmental objectives together (this appears to be the message of C2.4). [Anastasios Kentarchos, Belgium]</p>	Noted. Paragraph has been substantially rewritten. Figure no longer included.
32401	24	45	25	2	<p>This statement fails to acknowledge the tensions between private corporate gains and long-term public climate benefits, while it is these tensions that are the main cause of unsustainable land management. [Simone Lovera-Bilderbeek, Paraguay]</p>	Rejected. This assertion is not covered in underlying chapters for elevation to SPM through peer reviewed literature.
30837	24		25		<p>Here are elsewhere, there is a lot of use of the term 'sustainable land management'. It is however a very broad category and it would be helpful to be clearer about what are key elements that are required for climate change adaptation and mitigation. There is a real risk that people adopt only those elements of SLM which are relatively easy and neglect the really important elements, if these are not spelt out specifically. [Mike Morecroft, United Kingdom (of Great Britain and Northern Ireland)]</p>	Accepted. Sustainable Land Management (SLM) approaches are outlined in all parts of the SPM. Section B in the new draft now includes a statement on SLM (B6), outlining elements of SLM. Enabling conditions for SLM are expanded in Sections C and D.
30247	24	1	28	10	<p>The big picture is little lost by the trees. The overall message is that the basic entry points for action are: i) bending the population growth, ii) shift to environmentally friendly diets (shifting to low animal protein diets and low fossil energy use), iii) strongly improve and distribute technology that is land, energy, water and nutrient efficient. This requires strong governments and skilled institutions to support and facilitate the process, multi actor, multi scale and multi domain. Technology transfer and any support from developed to developing countries is to the benefit for all: One planet, one target, one chance. [, Netherlands]</p>	Thank you. This comment has been elevated for discussion in the overall SPM revisions process.
8769	24	1	28	10	<p>overall I don't see enough discussion of food production priorities in food deficient countries - increasing productivity is a policy priority and this often appears to be at odds with sustainability goals (although such views are debatable). In Section C this seems to be a major gap [Jean-Luc Chotte, France]</p>	Partially accepted. Sustainable intensification is implicit in C3.1 and C3.3. Given this is a report on climate change, food, and land the focus is on ensuring food security in a way that is both resilient to climate change and does not drive climate change. Hence, much of the framing of the report is integrative, so there is no explicit focus on productivity growth per se, rather ensuring food security via sustainable land management (which includes sustainable intensification = "productivity growth"). The issues are more explicitly explored in Ch 5.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
23083	24	1	28	11	<p>Section C general comments:</p> <ul style="list-style-type: none"> * while there is some merit in combining mitigation and adaptation 'responses', they are quite different in nature. The section should make greater efforts to reflect this rather than merely make frequent references to "adaptation and mitigation". * the section should make greater efforts to ensure its statements about land degradation, food security and sustainable land management have a clear relationship to climate change or climate action in keeping with the scope of this report. General commentary about these phenomena (without a clear climate change link) should be avoided. * Revisit the headline statements of this section. Although each one frames the individual subsections quite well, when read together (i.e. as a collection of key findings) they are very repetitive and similar to each other. * The sections themselves are also similar (esp C2, C4 & C5) and should be merged - using the space saved to provide further elaboration and examples. [Anastasios Kentarchos, Belgium] 	Accepted. All statements in Section C have been revised and restructured to reduce overlaps. All statements revised to ensure clear relationship to climate change.
30405	24	1	28	11	C-section: This section should also pay attention to (tropical) deforestation which causes more than 12% of global GHG emission/y. If deforestation is considered to be part of land degradation, then it is duly covered in this chapter. However in chapter A nor B a definition of land degradation encompassing deforestation can be found. [, Netherlands]	Thank you. This comment has been taken into account in the revisions process.
20893	24	34	28	10	Significant amounts of the sections C2, C4 and C5 can be combined and/or removed. Key messages to retain would be that collaboration between institutions and levels is important to achieve effective and context-specific land management and climate response, and that policy must be carefully designed to maximise cobenefits. Other parts of these sections (in particular C2.2, C2.3, C2.4, C4.1, C4.2, C4.3, C5.1 and C5.2) go into far too much detail for a summary for policy makers, could be significantly simplified, and in some parts simply descend into a list of policy types (which is again too much detail) [, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. SPM sections have been rewritten and simplified.
29955	24		28		Section C has many repetitions and could be condensed. Also the statements are too general. What will be the impacts and what actions should be taken? And what are time scales that lead to positive impacts? Currently it feels that sustainable practices can solve all problems we face. [, Estonia]	Partially accepted. All statements in Section C now revised and restructured to reduce repetitions. Impacts are addressed in section A.
15911	24	9			and transnational! [Caroline Vincke, Belgium]	Thank you. This comment has been taken into account in the revisions process.
15913	24	11			Some practises could also be handled by transnational programs, because of the land use teleconnections and down-wind effects (2.6.4, chapter 2). [Caroline Vincke, Belgium]	Thank you. This comment has been taken into account in the revisions process.
23093	24	23			Add 'generally' to "... Practices generally result in ..." [Anastasios Kentarchos, Belgium]	Thank you. This comment has been taken into account in the revisions process.
15915	24	27			to add a sentence after "...the carbon sinks". "Restoration of degraded natural ecosystems and protection of their landscape connectivity is also essential". [Caroline Vincke, Belgium]	Thank you. This comment has been taken into account in the revisions process.
23275	24	28			These alternatives only reduce emissions if the alternatives are powered by renewable energy sources. [Mark Howden, Australia]	Thank you. This comment has been taken into account in the revisions process.
15917	24	30		33	I would convert this in point C11! And add the term "governance" in the section: this is a main risk for the implementation of sustainable land management practise. • Surlignement, page 2524 [Caroline Vincke, Belgium]	Thank you. This comment has been taken into account in the revisions process.
32941	24	32			Delete "property rights" and insert "tenure". Relationships with land are not always in the form of property "rights". [Doreen Stabinsky, United States of America]	Thank you. This comment has been taken into account in the revisions process through rewriting and rewording for clarification.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
32943	24	32			Delete "private". Incentives may be public or private. [Doreen Stabinsky, United States of America]	Thank you. This comment has been taken into account in the revisions process through rewriting and rewording for clarification.
2107	24	33			Robust Evidence/high agreement [Tomas Molina, Spain]	Thank you. This comment has been taken into account in the revisions process.
32945	24	37			Don't reify pathways. Delete "modelled socio-economic pathways" and replace with "approaches". [Doreen Stabinsky, United States of America]	Noted. SSPs have been further elaborated and explained in Figure 4.
29275	25	3	25	3	This paragraph contains statements that sound rather obvious. Possible to say something more and clearer? [Jan Fuglestedt, Norway]	Noted. Paragraph has been substantially rewritten.
7665	25	3	25	3	the word "hazards" is used in this sentence which is limiting to those impacts regarded as hazards. Many climate change impacts are threats and may slowly emerge and reach thresholds well below what might be regarded as a hazard. Temperature increases affecting natural ecosystems for example or lower level inundation of low lying areas on a sunny day (Florida). Suggest the word be changed to "climate impacts" or "threats". [Judy Lawrence, New Zealand]	Noted. Paragraph has been substantially rewritten.
23099	25	3	25	12	Specify the key elements needed for building adaptive capacity: access to resources, technological capacity, access to information, governance and institutional mechanisms. Eg in: Adger, 2003; Brooks et al., 2005; Jones et al.,2010; Cinner et al., 2011; Eakin et al., 2014; Williams et al., 2015 [Anastasios Kentarchos, Belgium]	Noted. Paragraph has been substantially rewritten. Only new knowledge developed in land and climate report covered in SPM.
38399	25	3	25	12	This paragraph describes the optimal outcome of synergistic policies but does not adequately inform policymakers about what to avoid, or how this would be done in practice. [, United States of America]	Noted. Paragraph has been substantially rewritten.
13457	25	4	25	8	This paragraph should include a definition of land degradation neutrality. [Lourdes Tibig, Philippines]	Rejected. Definitions are in glossary and chapters.
20895	25	5	25	5	This is the first time the term "land degradation neutrality" has been used - could you define it or use a more non-expert friendly term (e.g. "reduce land degradation")? [, United Kingdom (of Great Britain and Northern Ireland)]	Rejected. Definitions are in glossary and chapters.
38401	25	5	25	5	The reader likely will understand the term 'land degradation', but some readers would benefit from a brief definition of the term 'land degradation neutrality'. For example, 'and land degradation neutrality (ceasing the degradation of land) are implemented.' Alternatively, in this initial part of the document, where the idea of land degradation neutrality is introduced, consider not using 'neutrality' in this first paragraph so that the reader can understand the concept without wrestling with the term. For example: 'Co-benefits exist if policies that advance food security and limit land degradation neutrality are implemented simultaneously.' [, United States of America]	Noted. LDN has been covered earlier in the SPM, and the core chapters.
24611	25	5	25	6	The concept of land degradation neutrality needs a higher profile in this Report. There are analyses available which quantify the costs and benefits, including climate and ecosystem benefits. A box on this topic may be useful. [, Ireland]	Noted. LDN has been covered earlier in the SPM, and the core chapters.
32403	25	5	25	16	Per definition, land degradation neutrality does not provide any benefits. Absolute reduction of land degradation provides (co-) benefits. [Simone Lovera-Bilderbeek, Paraguay]	Noted. Paragraph has been substantially rewritten.
38403	25	6	25	6	The phrase, 'advancing international land degradation neutrality' is not clear and could be changed to 'halting international land degradation.' [, United States of America]	Accepted. SPM revised.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
38405	25	6	25	8	This sentence as phrased is ambiguous as to the meaning of "international land degradation neutrality." The definition of land degradation neutrality (LDN) is given on page 4-60: "LDN is defined as 'a state whereby the amount and quality of land resources necessary to support ecosystem functions and services and enhance food security remain stable or increase within specified temporal and spatial scales and ecosystems.'" Suggest replacing "international land degradation neutrality" with "land degradation neutrality on an international scale." [, United States of America]	Noted. Paragraph has been substantially rewritten.
38407	25	6	25	8	This statement is lacking a confidence statement. [, United States of America]	Accepted. Sections are revised and confidence language included where applicable.
38409	25	6	25	8	The sentence is long and challenging to follow. Consider breaking it into two sentences, which could read: 'Sustainable land management is advanced and food security is improved when we conserve biodiversity and ecosystem services in combination with good land practices. Controlling international land degradation, and fostering associated land protection standards and certification, also promote sustainable land management and food security.' [, United States of America]	Accepted. SPM revised.
38411	25	7	25	8	How are 'standards and certifications' different from 'guidelines'? Are 'standards and certifications' contained within guidelines? [, United States of America]	Noted. Section has been substantially redrafted. Distinction explained in 7.5
38413	25	8	25	11	This statement does not appear to be well supported by the referenced section of the underlying report. [, United States of America]	Noted. Paragraph has been substantially rewritten. Confidence statements checked in report.
27805	25	9	25	10	phrase 'sustainable land management solutions contribute to addressing desertification, in the sentence is difficult to understand their mean. I think it should be described by reverse. [Raehyun Kim, Republic of Korea]	Accepted. SPM revised.
24243	25	12	25	13	There is a need to insert between paragraphs C2.3 and C2.4 a new paragraph on "how policies are being effectively implemented3. having policy or policies is not enough. They need enabled environments to be implemented and sometime even political will. [Kamal Djemouai, Algeria]	Noted. SPM revised to cover hybrid governance for importance of government in implementing, barriers to address in relation to implementation.
23101	25	13	25	13	Is "environment footprint" exclusively linked to agriculture only. What about cutting down of trees for example? [Anastasios Kentarchos, Belgium]	Accepted. SPM revised.
14595	25	13	25	13	The term 'land degradation neutrality' is not defined, and its meaning may not be apparent to readers of the report. [, Canada]	Accepted. Language surrounding LDN added.
4953	25	13	25	13	We would suggest clarifying what the "target" means (whether it means SDGs or not). [, Japan]	Noted. Paragraph has been substantially rewritten.
38415	25	13	25	13	There is no internationally agreed target for land degradation neutrality. Suggest removing the words "Achieving the target of". [, United States of America]	Accepted. SPM revised.
24613	25	13	25	16	The target for land degradation neutrality should be clear. Also, the potential benefits for similar targets in other areas could be considered [, Ireland]	Accepted. SPM revised.
23103	25	17	25	17	Why "regional" basis only excluding "local and national"? [Anastasios Kentarchos, Belgium]	Accepted. SPM revised.
31595	25	17	25	18	(...) and access to food, information, adequate technology and capacity building... [, Brazil]	Noted. Section has been substantially redrafted.
24615	25	17	25	22	The statement on gender equity etc. has a broader basis than regional [, Ireland]	Accepted. SPM revised.
38417	25	17	25	22	What about education, outreach, and stakeholder development? [, United States of America]	Noted. Paragraph has been substantially rewritten. SPM covers new information of the land and climate report.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
32947	25	19	25	21	indigenous and local knowledge are certainly important sources and contributions to agroecological practices but this wording misinterprets the relationship. See comments made on the underlying chapter and references cited, in particular Atlieri et al. 2015. Agroecology and the design of climate change-resilient farming systems. [Doreen Stabinsky, United States of America]	Accepted. SPM revised.
29953	25	19	25	22	To what extent can local and indigenous knowledge support agroecological practices? What is the evidence here? [, Estonia]	Accepted. SPM revised.
20897	25	19	25	22	shouldn't this say 'modern' agroecological practices? (also an issue in the exec summary) [, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. SPM revised. This statement deleted.
14597	25	20	25	20	<Distilled> is not a culturally relevant terminology to refer to Indigenous Knowledge. Rather, IK can be 'incorporated into' agroecological practices. [, Canada]	Accepted. SPM revised.
24245	25	23	25	23	the "Adaptive management" notion or concept need more explanation and some examples in this SMP to get its full consideration by decision makers. [Kamal Djemouai, Algeria]	Noted. Figure is deleted. Different aspects of decision making and policy expanded on.
7279	25	23	25	28	An assessment of this bullet point is required. [Debra Roberts, South Africa]	Accepted. SPM revised.
24617	25	23	25	28	I assume that mitigation of climate change is included here and that some confidence levels can be provided? [, Ireland]	Noted. SPM revised and section no longer exists.
821	25	23	25	28	this paragraph does not include any confidence level. Either it is added or the paragraph should be deleted. [, Spain]	Accepted. SPM revised.
20899	25	23	25	28	isn't the reason it's adaptive that it is flexible and 'adaptable', i.e. it is constantly revised (as opposed to just inclusive)? The caption under the figure better summarises it maybe? [, United Kingdom (of Great Britain and Northern Ireland)]	Noted. Paragraph has been substantially rewritten. Figure no longer included.
29277	25	23	25	28	I suggest you make the link to SPM 8 clearer. [Jan Fuglestedt, Norway]	Noted. Figure has been deleted.
23287	25	23	25	28	There are many different subsidiary methods for engaging with stakeholders/policy. Adaptive management (sensu stricto) is one of them. The description of the activity in C2.6 falls under the broader umbrella of participatory research - in this case climate adaptation research. So why confuse the policy reader who may not be across the different literatures and uses of the term and stick to the core business of IPCC - which in this case is about risk management applied to climate adaptation and mitigation. So perhaps change this to: 'Participatory engagement is a systemic approach that can support decision-making in relation to the development of locally-appropriate sets of climate response options. By providing a dynamic, participatory approach to climate adaptation and mitigation that includes stakeholders in co-designing objectives, approaches and implementation pathways, participatory research can provide a better basis for risk management.' {Fig SPM8, 7.7.3} [Mark Howden, Australia]	Accepted. SPM has been revised and figure is deleted.
22133	25	23	25	29	C2.6-Kindly check: Risk perception, risk analysis and risk management-risks due to climate change to be addressed properly. [Suvadip Neogi, India]	Accepted. SPM revised.
27689	25	23	30	22	The term "adaptive management" that is used in the title of Figure SPM.8 on page 26 as well as in paragraphs C2.6, C4.1, D3.4 is misleading since "adaptive" in the context of climate change and the IPCC is generally understood as related to adaptation to climate change impacts. In the SRCCL however it is not limited to adaptation issues, but generally refers to an iterative/responsive/learning management approach. To avoid misunderstandings among the audience of the SPM, we would advice replacing "adaptive" by one of these other terms. [, Germany]	Noted. Figure has been deleted.
2109	25	19			Robust Evidence/high agreement [Tomas Molina, Spain]	Copy edit to be completed.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
15919	25	23		25	yes indeed. But it needs i) resoures, ii)political will, ii) follow-up, iv) time. It is a well actors-grounded long term strategy that needs to be supported by facilitators. [Caroline Vincke, Belgium]	Noted. SPM has been revised and figure on adaptive management deleted.
32949	25	23			Adaptive management is rather unhelpful jargon -- some more descriptive language would be better, in particular for a public-facing document. [Doreen Stabinsky, United States of America]	Noted. Figure of adaptive management deleted. Different aspects of decision making and policy expanded on.
29761	26	17	19	26	Can include wet land and marine restoration to account for water-based food systems [Tanya Smith, Canada]	Noted. However, since this literature is not assessed in the report, it may not be possible to include ehre
20901	26	1	26	1	This figure is not very helpful as currently formulated, as it is not entirely clear if or how adaptive management and disaster risk response are related, how their processes relate to the central part of the figure (vulnerability, hazard, exposure). It is also unclear exactly how the processes themselves work, and may be better represented as a flowchart. It is also unclear whether there is a need for this, as Adaptive Management is not strongly featured in the SPM, so going into the detail of how it works seems too granular a level of detail. [, United Kingdom (of Great Britain and Northern Ireland)]	Figure SPM8 was removed from the SPM
38419	26	1	26	1	To help the reader sync the graphic with the description for the figure, use the same term in the graphic that is used in the description for the figure. Also consider adding matching numbers for the steps in both the text and the graphic so that it is even easier for the reader follow. Use the same part of speech for each of the items, where possible (i.e., 'identifying', 'making' and 'advancing' or 'identify', 'make', and 'advance'). [, United States of America]	Figure SPM8 was removed from the SPM
7745	26	1	26	1	There ara a few words in the Fig. SPM 8, which are failed in; for example, 'o' of outcomes at left most keyword and 'y' of identify at the lower most keyword. [Hiroaki Kondo, Japan]	Figure SPM8 was removed from the SPM
32981	26	1	26	1	I found that this figure tends to confuse rather than illuminate and I would recommend deleting it. It morphs the (otherwise recognisable) hazard-exposure-risk diagram from the AR5 WGII Report and associated AR5 SPM. The 'hazard' section is now associated in this diagram with 'who' is affected by various hazards but this doesn't logically correlate with the arrows and texts added to the left and right. E.g. It seems to suggest that DRR is not associated with the 'who' in the 'hazard' circle? By contrast, I think the simple Chapter 7 - Figure 7.8 on page 7-83 does a more straightforward and easily understandable job of visualising the key concepts in adaptive risk governance. I would recommend using that instead. [Mairi Dupar, United Kingdom (of Great Britain and Northern Ireland)]	Figure SPM8 was removed from the SPM
8621	26	1	26	1	I don't see the relevance of this figure. [Marc Aubinet, Belgium]	Figure SPM8 was removed from the SPM
17165	26	1	26	1	Figure, left side: "Formulate evaluation criteria, Estimate outcomes, Evaluate trade offs": left part of letter "o" in "outcomes" is not visible. [Renaud Toussaint, France]	Figure SPM8 was removed from the SPM
17167	26	1	26	1	Figure, lower left side: The lower part of the text 'identify objectives' is not visible [Renaud Toussaint, France]	Figure SPM8 was removed from the SPM
8807	26	1	26	6	Check wording in the blue field: We propose to replace the term "Marginalized people" with vulnerable people. Reason: The term "vulnerable people" highlights the condition that needs to be addressed rather than the complex causalities that are referred to in the term "marginalized people". [Jean-Luc Chotte, France]	Figure SPM8 was removed from the SPM

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
6137	26	1	26	9	From AR4 to AR5, the risk concept focuses on assessing the risk of specific consequences or impacts that may harm a system. The vulnerability of the system is now one of three components of the risk. Consequently, the assessment is called 'climate risk assessment' instead of 'climate change vulnerability assessment'. Is it possible to update the figure SPM 8. [Jacques-Andre Ndione, Senegal]	Figure SPM8 was removed from the SPM
40349	26	1	26	10	SPM figure 8: adaptive management and risk. It may be time to retire this figure which originated in SREX (dealing with disaster / extreme risks and climate) and which was carried forward in AR5 WG2. It is not clear the value this graph adds now 8 years after SREX, as it is mostly conceptual, rather than data- or evidence-based and in the context of SRCCL does not as powerfully point to the areas policy makers need to take action as it did back in the SREX days when "reducing vulnerability" was a somewhat fresh message. Now that the SR1.5 has come out, the audience will be more aware than ever that risks are significant and systemic...yet this graph with its roots in disaster risk management does not yet provide deeper insights or evidence from the literature about the intensity, rate or scale of changes in land and climate systems that affect human values. This graph is problematic in many ways because of the underlying concept of risk as a function of hazard, exposure, and vulnerability. This (often deterministically interpreted) portrayal sends the audience back to a conception that emergency response and managing extreme events are the commensurate actions for sizeable risks emanating from interactions of climate and land system change. This may be an inadequate or inappropriate framing given what the SRCCL is trying to accomplish: an understanding of risk to society from a first-time ever assessment of the interactions of land and climate systems as they change. This reaches beyond disaster risk management which is often confined within particular systems defined by a range of intensities seen in that locale, by space, and by time. Please deepen the risk analysis and do not carry this graph forward (or at least not without a modernised and relevant version of the necessary concepts to move the SPM narrative forward) without a serious stress testing whether the underlying concepts really answer to the risks that decision makers are asking about. [Koko Warner, Germany]	Figure SPM8 was removed from the SPM
40357	26	1	26	10	SPM figure 8: adaptive management and risk. It may be time to retire this figure which originated in SREX (dealing with disaster / extreme risks and climate) and which was carried forward in AR5 WG2. This framing limits conceptualization of risk to a fairly narrow and physical-impacts oriented understanding and does not yet take into account the intensity, rate or scale of changes in land and climate systems that affect human values. This graph is problematic in many ways because of the underlying concept of risk as a function of hazard, exposure, and vulnerability which sends the audience back to a conception that emergency response and managing extreme events are the commensurate actions. This may be an inappropriate framing given what the SRCCL is trying to accomplish: an understanding of risk to society from a first-time ever assessment of the interactions of land and climate systems as they change. This goes quite beyond disaster risk management which is often confined within particular systems defined by a range of intensities seen in that locale, by space, and by time. Please deepen the risk analysis and do not carry this graph forward without a serious stress testing whether the underlying concepts really answer to the risks that decision makers are asking about. [Koko Warner, Germany]	Figure SPM8 was removed from the SPM

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
17835	26	1	26	10	It is not entirely clear why figure SPM 8 needs to be in the SPM, although it is perhaps useful to illustrate what adaptive management is. The figure should provide some examples for "Exposure" in a similar way to the examples provided for Vulnerability and Hazard, as otherwise readers need to refer back to AR5 to understand. [Quentin Lejeune, Germany]	Figure SPM8 was removed from the SPM
15323	26	1	26	28	Suggest the core element of the diagram should be mitigation and adaptation, with risk assessment being a means to inform these actions. The message here is that adaptive management should be an element of adaptation and mitigation response options, which require monitoring, evaluation and adjusting according to the changing conditions/ information. [, Australia]	Figure SPM8 was removed from the SPM
24443	26	3	26	9	We see little added value in including this figure in the SPM. We suggest deletion, as there are many other figures. [, Belgium]	Figure SPM8 was removed from the SPM
29281	26	3	26	9	I suggest you coordinate the use and any revisions of this with WGI (Jana Sillmann, Carolina Vera) and WGII (Brian O'Neill and others). [Jan Fuglestedt, Norway]	Figure SPM8 was removed from the SPM
20903	26	4	26	7	this could be simplified, e.g. the adaptive management approach identifies and responds to exposure and vulnerability to land and climate change impacts. Decisions and instruments are continuously monitored, evaluated and adjusted to changing conditions. (...) [, United Kingdom (of Great Britain and Northern Ireland)]	Figure SPM8 was removed from the SPM
38421	26	4	26	9	To provide more clarity, consider changing the text describing the figure to read: 'climate change impacts by 1) identifying problems and objectives, 2) formulating criteria, 3) making decisions, and 4) implementing and adjusting.' For whatever words you end up with, add the corresponding numbers to the corresponding phrases on the graphic. Make sure that at least the initial portion of each numbered phrase on the graphic matches the numbered phrase in the figure description. Do the same for the "Disaster Risk Response" side of the graphic. [, United States of America]	Figure SPM8 was removed from the SPM
32405	26	4	26	9	It would be good to highlight the role of Indigenous traditional knowledge and customary sustainable use in adaptive management approaches, in line with Chapter 4 (4.10.1.1) and Chapter 7 (7.6.5.1) [Simone Lovera-Bilderbeek, Paraguay]	Figure SPM8 was removed from the SPM
6877	26	11	26	11	This title should be adjusted. While it is of course correct, it suggests that most land based options have multiple co-benefits, which is not true when it comes to bioenergy (as it clearly shown in the table 1). And as bioenergy is so prominent in many scenarios, the title is misleading. Maybe say "A number of" or "certain types of". Or "Many policy options in support of sustainable land management have multiple co-benefits for desertification, land degradation, food security and health". [Markus Giger, Switzerland]	Accepted. Section revised. See B7 in the revised draft
23105	26	11	26	12	This section should also mention the multiple trade-offs, or there should be a separate section for those. It is just as important to avoid/limit trade-offs as it is to capitalise on co-benefits. Trade-offs should include: - Competition for land among options and needs (food versus bioenergy, afforestation or restoration) - The increased removal of organic matter and nutrients through increased bioenergy and BECCS - Increased water use and competition for water by bioenergy and afforestation - Increased use of and competition for mineral fertilizers. [Anastasios Kentarchos, Belgium]	Accepted. The tradeoffs of land competition, water, desertification and land degradation are now addressed in B7.3
28303	26	11	26	12	Multiple co-benefits should also include the conservation of biodiversity. [Barron Joseph Orr, Germany]	Accepted. Biodiversity benefits are now included in Section C1.3

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
7281	26	11	26	12	An assessment of this bullet point is required. [Debra Roberts, South Africa]	This section is revised and part of this is in Section B. Uncertainty language is suitably applied as suggested
32565	26	11	26	12	We suggest to rephrase : "There are land-based ..." (instead of "Many land-based") and then add "could be prioritized, taking into account that other measures have negative side effects". The statement seems naïvely optimistic as it is now. [, Belgium]	Agreed. Co-benefits and trade-offs are now addressed in detail in sections B1, B2 and B5 in the revised draft
32701	26	11	26	12	We suggest to rephrase : "There are land-based ..." (instead of "Many land-based") and then add "could be prioritized, taking into account that other measures have negative side effects". The statement seems naïvely optimistic as it is now. S [, Belgium]	Agreed. Co-benefits and trade-offs are now addressed in detail in sections B1, B2 and B5 in the revised draft
30211	26	11	26	12	add "health" at the end of the sentence, since dietary changes (covered in C3.2) have clear health benefits [, Netherlands]	Accepted. This is now HS C2 in the revised draft
823	26	11	26	12	"co-benefits for desertification" could be misinterpreted. Replace by "co-benefits for reducing desertification". The same applies to land degradation. [, Spain]	Agreed. The section is revised
8869	26	11	26	12	include benefits for biodiversity as well [Jean-Luc Chotte, France]	Agreed. Biodiversity benefits are now included in Section C1.3
32667	26	11	26	12	We suggest to rephrase : "There are land-based ..." (instead of "Many land-based") and then add "could be prioritized, taking into account that other measures have negative side effects". The statement seems naïvely optimistic as it is now. [Jean-Pascal van Ypersele, Belgium]	Agreed. Co-benefits and trade-offs are now addressed in detail in sections B1, B2 and B5 in the revised draft
8613	26	11	26	12	Co benefits are not systematic. I think this sentence should write "Land-based policy options for adapting to and mitigating climate change that offer multiple co-benefits for... should be prioritized. [Marc Aubinet, Belgium]	Accepted. Sections B and C are now revised. Please see B1-B7 in the revised draft
22135	26	11	26	12	C3-Kindly check: Please provide confidence statement. [Suvadip Neogi, India]	This section is revised and part of this is in Section B. Uncertainty language is suitably applied as suggested
3973	26	12	26	12	Write: "... co-benefits for reducing desertification and land degradation, and strengthening food security." [, Switzerland]	Noted. Section revised
23107	26	13	26	15	Reconsider this statement. Its intended meaning is not at all clear. What is this trying to say? [Anastasios Kentarchos, Belgium]	Noted. Section revised
26007	26	13	26	15	The informative content of this paragraph is very low. [, France]	Noted. Section revised
24619	26	13	26	15	Unclear what the exact point of this statement is. Define response options. [, Ireland]	Noted. Section revised. Sections B1, B2 and B5 provide detailed co-benefits and trade-offs
8763	26	13	26	15	Research has shown that you get better value for money by implementing SLM to avoid land degradation, compared to restoring degraded land (see for example the work of the Economics of Land Degradation). This is implicit in the LDN response hierarchy and is well accepted by governments, at least in principle. It is an important policy message and this is a good place to include it. [Jean-Luc Chotte, France]	Accepted. See section D2.2 in the revised draft
30843	26	13	26	15	this is obvious and doesn't need a confidence statement. [Mike Morecroft, United Kingdom (of Great Britain and Northern Ireland)]	Noted. Section is revised
22137	26	13	26	15	C3.1-Please check: '.....trade-offs and synergies'.....also co-benefits? [Suvadip Neogi, India]	Noted. Section revised
29279	26	14	26	15	This statements soundS rather obvious. Possible to say something more and clearer? [Jan Fuglestedt, Norway]	Accepted. Section is revised

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4955	26	16	26	17	As the specific examples of "low cost" or possibly "negative cost" options, "improved health through improved diets" is mentioned. However, the definition/scope of this "cost" is not clear. We would suggest including not only direct cost, but also the hidden cost (opportunity cost, for example, in economics). In the main text, there is no straightforward expression such as "low cost" or "negative cost", although it is shown that "benefits" of improved health through improved diets can exceed its "direct costs" (Ch.5, p.5-71, L18-30, and Ch.7, p.7-31, L41-45). Most importantly, the main text specifies that the whole cost of achieving improved health through improved diets can be "high", rather than "low", by stating that "diets are deeply culturally embedded and behavior change is extremely difficult to effect, even when health benefits are well known; Macdiarmid et al., 2016" (Ch.6, p.6-84, L2-5, and p.6-84, Table 6.20). Therefore, reconsidering the whole paragraph while explicitly defining the concept of a cost, which seems to be narrowly defined in the current version, is recommended. [, Japan]	Thank you. The chapters and previous SPM draft received a lot of comments on economic dimensions. The authors have attempted to clarify some of these issues in the revised SPM draft. A new cross-chapter box on Economic Dimensions is also included in Chapter 7 to provide more clarity
33957	26	16	26	17	The relevance of the reference to "options in food systems" is not clear. Suggest relating more directly to land use. [, Norway]	Accepted. See Section C2 in the revised draft
13461	26	16	26	17	What is meant by "cost negative"? [Lourdes Tibig, Philippines]	Noted. This term is removed in the revised draft as the section is revised
20905	26	16	26	18	Which response options are these? Can you elaborate? Also, the 2nd sentence doesn't seem to fit very well with the 1st - what's the connection? [, United Kingdom (of Great Britain and Northern Ireland)]	Noted. Section C2.5 in the revised draft discusses food system policies
24621	26	16	26	19	These points have been made earlier. Overall there is a significant amount of repetition that can be reduced, which could either shorten the Report or allow for more substance of interest for policy makers [, Ireland]	Accepted. Section C is revised. See Sections B1-B7 in the revised draft
3975	26	16	26	19	Paragraph C3.2 consists of two generic sentences that do not refer to climate change, and these sentences have no link. Would it be possible to improve the paragraph? [, Switzerland]	Accepted. Section 3.2 is now revised. See B1, B2, B5 and B7 in the revised draft
6139	26	16	26	19	Authors pointed out the issue of "positive economic returns". It would be good, if they can be more targeted and precised by giving some rates of these positive economic returns; some quantitative statistics are expected here... [Jacques-Andre Ndione, Senegal]	Noted. See revised section D2.2
24247	26	17	26	17	the word "investments" may need to include from which actors : public and/or private, or both. Same remark applies to paragraph C3.5. [Kamal Djemouai, Algeria]	This could be context specific. Hence difficult to generalize
33959	26	17	26	19	We assume that it here is ment restoration for the purpose of mitigation or adaptation. Please consider to be more specific in this statement if appropriate. [, Norway]	Accepted. The section is revised. Please see Section D2.2 in the revised draft
4957	26	18	26	19	We would suggest clarifying the assumed level of investment, or replace the sentence "(...) have positive economic returns" to "have opportunities to obtain positive economic returns" if specific level is not assumed here. [, Japan]	Noted. Section revised. See Section D2.2 in the revised draft
13463	26	20	26	20	Is desertification an extreme weather event? [Lourdes Tibig, Philippines]	Thank you. Corrected
23109	26	20	26	22	Please modify as follows: "On-farm and off-farm livelihood diversification strategies can increase the resilience of rural agricultural households against extreme events, such as droughts, floods, fires and desertification, etc. (high confidence)" [Anastasios Kentarchos, Belgium]	Noted. Section C3 is now revised. See B1-7 and D in the revised version of the SPM
15019	26	20	26	22	Needs revision. What is this statement based on and why is confidence high? [Katharina Waha, Australia]	Accepted. Section C3 is revised. See Sections B1-B7 in the revised draft
24625	26	20	26	28	This is a large bullet; perhaps split into two bullets [, Ireland]	Noted. Sections B and C are revised to improve flow

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20907	26	20	26	28	C3.3 does not seem to fit well in section C3, as it seems to focus more on actions than increase investment in climate action, as opposed to the co-benefits of adaptation and mitigation, and might be better placed in the sections about policy (C5) or costs (C1). [United Kingdom (of Great Britain and Northern Ireland)]	Thank you. Sections B, C and D are now revised to improve flow.
22139	26	20	26	28	C3.3-Please check: Climate change impacts will affect the economy as the nations adapt/respond to stresses on ecosystem services. More needs to be understood about estimating the economic impacts of climate change mitigation measures than estimating the cost of inaction or adaptation. Might be helpful: analyses of the economic impacts of policies considering (i) how mitigation measures can advance or impede economic development goals; (ii) building support for mitigation measures among state and local decision-makers and stake holders and (iii) identifying opportunities where meeting present day climate change challenges can serve as an economic development strategy [Suvadip Neogi, India]	Noted. Section revised
24623	26	21	26	21	Is desertification an extreme weather event? [Ireland]	Thank you. Corrected
23111	26	22	26	23	Needs an explanation of what "strengthening collective action" means in this context. Also, it makes intuitive sense that market access can improve profitability - but is less obvious this would motivate investments in sustainable land management. The evidence for this needs some explanation if the statement is to be retained. [Anastasios Kentarchos, Belgium]	Noted. Section revised. See also C4 in the revised SPM draft
8765	26	22	26	23	It would be helpful to the reader to provide an illustration of collective action addressing desertification causes - it is not self-evident. [Jean-Luc Chotte, France]	Noted. See Section C4 in the revised draft
32407	26	22	26	28	The findings about the valuable role of collective action in forest conservation and restoration, and ecosystem conservation and restoration in general in Chapter 7 (7.6.5.3) should be better reflected here. [Simone Lovera-Bilderbeek, Paraguay]	Noted. Section revised. See also C4 in the revised SPM draft
32951	26	23	26	24	The phrase "such as those based on new information and communication technologies" doesn't make sense here and I was unable to find reference in the underlying chapter. Delete. [Doreen Stabinsky, United States of America]	Noted. Section is revised. Please see Section D1.3 in the revised version
3977	26	23	26	26	Is this statement based on solid evidence? Would it not be better to write: "... may raise (line 24) ..." and "... may motivate ..." (line25)? [Switzerland]	Noted. Section revised. See sections B, C and D in the revised draft
27807	26	26	26	27	The Contents related to the sentence 'Promoting schemes that provide payments for ecosystem services can provide additional incentives to land users to adopt sustainable land management practices (medium evidence,' would be better to separate other paragraph.Because many countries could be very interested in this mean. Or move to C3.5 section [Raehyun Kim, Republic of Korea]	Noted. Section C3 is now revised. See B1-7 and D in the revised version of the SPM
23113	26	26	26	28	This statements should be further elaborated and clarified. [Anastasios Kentarchos, Belgium]	Accepted. Section C is revised. See Sections B1-B7 in the revised draft
23115	26	26	26	28	Avoid 'payment for ecosystem services'. Eg. returns, incentives, or benefits might be better as they avoid the financial component, which is not always successful and often not what participants value most. [Anastasios Kentarchos, Belgium]	Noted. See section A1.1 in the revised draft. A new box on Economic dimensions is introduced in Chapter 7 to address this comment and similar comments
4959	26	26	26	28	The sentence "Promoting schemes that provide payments for ecosystem services (...)" seems correct in principle, but it is difficult to monetarily evaluate the ecosystem services and carry out specific actions. SPM is required to mention this difficulty and to provide some specific examples of action. [Japan]	Noted. See section A1.1 in the revised draft. A new box on Economic dimensions is introduced in Chapter 7 to address this comment and similar comments

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40347	26	26	26	28	I went back to check for the evidence provided in the chapters. ONLY section 3.7.3 provides evidence that ecosystem service payments incentivize land users to adopt SLM. Check and delete the additional cross references if they don't provide evidence to support. [Koko Warner, Germany]	Noted. Sections are revised
1601	26	11	27	7	Land-based policy options – [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	This section is now revised. Section B7 addresses land based options
1603	26	11	27	7	The UK government might benefit from making further plans for investments in land restoration for building new factories and retail stores, and to rehabilitate new dryland areas to stimulate new farming activity. [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	Noted
38423	26	11	27	7	The headline statement refers to adaptation and mitigation responses but the subbulleted statements do not provide additional details distinguishing between options relevant for the two processes. [, United States of America]	Accepted. Section is revised
26005	26	1			We believe this figure is relevant and justified, but is too generic. We suggest to use more specific land based findings to the issues discussed, related to the present report [, France]	Figure SPM8 was removed from the SPM
27691	26	1			Figure SPM.8 builds on the IPCC's approach to risk introduced by the SREX and presents the approach of adaptive management strategy. This strategy does not seem specific to the land sector, it wrongly omits mitigation of climate change which is a key risk reduction strategy, and it does not refer to sustainable land management. While this figure is generally interesting in the context of adaptation, we do not think it is appropriate or adds specific value to the SRCCL's SPM. In addition, the information in the parentheses for Vulnerability and Hazard seems incomplete and the reasons for the choice of the items listed are unclear. [, Germany]	Figure SPM8 was removed from the SPM
23277	26	3			This figure makes little sense. Adaptive management is not the same as adaptation, disaster risk reduction is not necessarily consistent with good mitigation practice (e.g. huge concrete sea walls) etc. The point of putting a partial learning cycle twice on the same diagram is not clear. The 'Hazards' bubble has items in there that are not hazards but are impacts – and hence does not fit the IPCC definition. This diagram should have mitigation and adaptation at the core of it as these are the two broad risk management activities we can take. And risk assessment (ie the Exposure, Hazard and Vulnerability bubbles) should be relegated to be a means to inform adaptation and mitigation action not be the core focus of the diagram. [Mark Howden, Australia]	Figure SPM8 was removed from the SPM
15925	26	7		7	the key word here is "continuously": monitoring has a cost and a long term value, but often stakeholders have a short term view. [Caroline Vincke, Belgium]	Figure SPM8 was removed from the SPM
23291	26	14			Change to 'all relevant locally applicable etc' [Mark Howden, Australia]	Noted. Section is revised
2111	26	17			Robust Evidence/high agreement [Tomas Molina, Spain]	Accepted
23289	26	18			Change to 'can have positive economic returns'. The implication of the current statement is that it is always true whereas it is not necessarily so. [Mark Howden, Australia]	Noted. Section is revised
23279	26	20			Change 'the resilience of rural agricultural households against' with 'the ability to cope with' [Mark Howden, Australia]	Thank you. The section is now revised
32953	26	26			For clarity delete the first part of the sentence. Delete "promoting schemes that provide" [Doreen Stabinsky, United States of America]	Noted. Section C is now revised
15921	26				"Vulnerability box": and unadapted land management [Caroline Vincke, Belgium]	Comment not clear as line number is not mentioned.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
15923	26				"Exposure box": but also timing in relation with phenology, frequency and intensity. [Caroline Vincke, Belgium]	Comment not clear as line number is not mentioned.
24445	26				We suggest to rephrase : "there are land-based ..." and then add "could be prioritized, taking into account that other measures have negative side effects". The statement seems naively optimistic as it is now. [, Belgium]	Noted. Section C is now revised. See B1-B7, C4 and D2 in the revised draft
13459	26				Figure SPM 8 accurately captures the concept of adapation management and risk. [Lourdes Tibig, Philippines]	Noted.
13323	27	8	11	27	C4. Sustainable land management decisions take into consideration the local engagement of stakeholders, social learning, and a suite of purposefully designed policy instruments (high confidence). Collaboration between relevant institutions and actors, including private investment sectors, can increase the effectiveness of policy instruments (medium confidence). [7.6.5, 7.7.6] [Marina Rosales Benites de Franco, Peru]	Noted. SPM revised and section no longer exists. These concepts have been rewritten.
23117	27	1	27	1	"Reduction of demand for agricultural commodities" is the outcome of good sustainable development policies and actions. It's not a policy, unless it relates to the reduction of policy-driven demand for agricultural commodities, such as crops for bioenergy. Suggest making the statement more precise: e.g. actions in to mitigate climate change and address several other sustainable development concerns (e.g. dietary change, waste reduction and circular economy) can reduce demand for agricultural commodities, thereby reducing pressure on land use and contributing to sustainable land management, reduced desertification etc. [Anastasios Kentarchos, Belgium]	Noted. Section C is now revised. See B1-B7, C4 and D2 in the revised draft
40359	27	1	27	1	How can reduction of demand for agricultural commodities happen? If you read the entire chapter it tells us that inefficiencies in the food system are increasing emissions (while other chapters point to increasing population as a cause of increasing GHGs from agriculture). The sentence might better read "reduction of inefficiencies within food system / agricultural system can help achieve sustainable land management". the reason is that increases in population does not lead to increases in emissions in the FOOD system...its the inefficiencies and proccesses of production that cause the GHGs. [Koko Warner, Germany]	Noted. Section C is revised. See Sections B1-B7, C4 and D2 in the revised draft
8615	27	1	27	1	meaning of "agricultural commodities" ? [Marc Aubinet, Belgium]	Noted. Senternational revimplications of the need for "up-front" investments are explaineded. Senternationals B1, B2 Climate B5 provife fetailed ni-benefits Climate trafe-importantfs
31597	27	1	27	3	Controversial. The definition of sustainable land management is not defined by the final product, but rather on the management strategies and technologies adopted. It is not the commodity that causes degradation, but inadequate soil management and other unsustainable practices. [, Brazil]	Noted. Section is revised
4961	27	1	27	3	We would suggest adding specific examples of action as the information is useful for policy making. In addition, it is difficult to understand how "The reduction of demand" would "enhance food supply". We also suggest adding further explanation. [, Japan]	Noted. Section revised. See also Section D2 in the revised draft
38427	27	1	27	3	C3.4 begins, "The reduction of demand for agricultural commodities can help to achieve sustainable land management, reverse desertification and land degradation, reduce greenhouse gas emissions and enhance food supply." How reducing demand can increase supply needs to be explained. [, United States of America]	Noted. Section C is revised. See Sections B1-B7, C4 and D2 in the revised draft
13465	27	1	27	3	""high/medium agreement" should be replaced by "medium to high agreement". [Lourdes Tibig, Philippines]	Noted. Section C is now revised. See B1-B7, C4 and D2 in the revised draft
15179	27	1	27	5	Not all agricultural commodities or dietary shifts are at issue here - hence the text should focus on ruminant consumption, expecially beef. [Daniel Zarin, United States of America]	Noted. Section C is now revised. See B1-B7, C4 and D2 in the revised draft

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24627	27	1	27	5	Avoid truisms. Without demand for food we would reduce the impacts of such demand to zero. A more useful statement would highlight how the impacts can be reduced or managed sustainably [, Ireland]	Noted. Section C is now revised. See B1-B7, C4 and D2 in the revised draft
20909	27	1	27	5	Point C3.4 is a repetition of C1 and of B5.4, consider deleting for brevity [, United Kingdom (of Great Britain and Northern Ireland)]	Noted. Section C is now revised. See B1-B7, C4 and D2 in the revised draft
38425	27	1	27	5	Section 5.5.2 includes the important point that ""... these studies, still examine the technical potential of changing diets. The feasibility of how to create transitions to more sustainable and healthy diets is still the subject of more research."" In particular, the chapter does not examine the potential impact of decreased food demand on the livelihoods of food producers, whether via reductions in prices or volume. This is an important dimension of feasibility that, if not possible to assess, should be acknowledged. [, United States of America]	Noted. Section C is revised. See Sections B1-B7, C4 and D2 in the revised draft
8809	27	2	27	2	The reduction of demand for agricultural commodities can also help to avoid desertification and land degradation. Therefore, please expand the sentence by including the following words (bold): "... to achieve sustainable land management, avoid and reverse desertification and land degradation, ...". [Jean-Luc Chotte, France]	Noted. Section is revised. See B1-B7 and D2 in the revised version
12613	27	3	27	3	Suggested addition after 'shifting diets': to include lower consumption of foods with low nutritional value, such as sugar, [Carina Millstone, United Kingdom (of Great Britain and Northern Ireland)]	Noted. 'shifting diet' is removed. Also section is revised. See Section B4 in the revised version
4963	27	5	27	5	At the end of the paragraph, closing bracket is missing. [, Japan]	Thank you. Corrected
7747	27	5	27	5	"{5.5.2"-->"{5.5.2}": missing "}". [Hiroaki Kondo, Japan]	Thank you. Corrected
7283	27	6	27	6	An assessment of this bullet point is required. [Debra Roberts, South Africa]	Noted. Confidence language corrected in the revised draft of the SPM
23119	27	6	27	7	Fully agree, but it does not seem to be mentioned in 4.10.1 [Anastasios Kentarchos, Belgium]	Noted.Line of sight checked and corrected for the revised draft of the SPM
32959	27	6	27	7	Reword. This is not a cause-effect relationship. [Doreen Stabinsky, United States of America]	Noted. Section revised
27693	27	6	27	7	This single phrase appears very important, but no implications of the need for "up-front" investments are explained. Please provide more information on this aspect (the cross reference to chapter 4.1.10 does not contain much information, please check). [, Germany]	Noted. Senternational revimplications of the need for "up-front" investments are explained. Senternationals B1, B2 Climate B5 provife fetailed ni-benefits Climate trafe-importantfs
24629	27	6	27	7	Unclear what this point tries to say to policymakers. Perhaps it can be elaborated into the need to develop scenarios and planning horizons [, Ireland]	Noted. Section revised. See also Section D2 in the revised draft
825	27	6	27	7	this paragraph does not include any confidence level. Either it is added or the paragraph should be deleted. [, Spain]	Noted. Confidence language corrected in the revised draft of the SPM
20913	27	6	27	7	This could be folded into point C3.3 as it reads like a continuation of the same points [, United Kingdom (of Great Britain and Northern Ireland)]	Noted. Sections B and C are revised to improve flow
22141	27	6	27	7	C3.5-Please check: Please provide confidence statement. [Suvadip Neogi, India]	Noted. Confidence language corrected in the revised draft of the SPM
20911	27	6	27	8	This section could be removed, as this message is substantially covered later in the SPM, in section D2.3 [, United Kingdom (of Great Britain and Northern Ireland)]	Noted. Sections B,C and D are revised to remove redundancy
3979	27	8	27	8	Write: " ... into consideration governance that provides for the local engagement of stakeholders ...". [, Switzerland]	Noted. SPM revised and section no longer exists.
24683	27	8	27	10	Sustainable land management is contingent on biophysical constraints that are inherent to the land and to climate [, Ireland]	Noted. SPM has been redrafted.

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23121	27	8	27	11	"Sustainable land management decisions [...]" stand-alone in the title may be seen as very restrictive compared to the food system approach in the body text and the Special Report on the whole, which we very much support. Proposed text to encompass the food system approach, adding right after "[...]" and a suite of purposefully designed policy instruments", the following text: "following the food system approach". [Anastasios Kentarchos, Belgium]	Noted. SPM revised and section no longer exists.
28305	27	8	27	11	This sentence is correct, but is missing the response mechanism -- land degradation neutrality -- which has been designed specifically to link all the elements in the sentence. The sentence should read "Sustainable land management decisions pursued within the framework of land degradation neutrality take into consideration the local engagement of stakeholders, social learning, and a suite of purposefully designed policy instruments (high confidence). Collaboration between relevant institutions and actors can increase the effectiveness of policy instruments (medium confidence). {7.6.5, 7.7.6}" [Barron Joseph Orr, Germany]	Noted. Section has been revised. LDN covered in other sections.
27695	27	8	27	11	Please consider and mention also institution building (and strengthening) which is often necessary for sustainable land management as assessed in chapters 6 and 7. [Germany]	Noted. Detail of institutions and response options have been expanded upon.
22143	27	8	27	11	C4-Kindly check: Policy instruments and their effectiveness also depend on available feasible technological interventions and cost involved for implementation/execution for long-term sustenance. Economic dimension i.e. environmental cost incurred towards adaptation and mitigation to climate change is a vital issue. Please address these issues. [Suvadip Neogi, India]	Noted. Section has been substantially redrafted. Costs have been outlined.
23123	27	8	27	35	Section C2, C4 & C5 comments The C2, C4 & C5 headline statements and the sections themselves are very similar to each other. Consider merging and using the space saved to provide more explanation and examples of some of the concepts. For example, it is very difficult to extract useful advice from C4.1, C4.2 & C4.3 at this level of abstraction. Furthermore, this advice about stakeholder consultation and inclusion is surely a component part of the advice offered in C2.3-C2.5 and C5.1. C4.4 would benefit from an example of where indigenous knowledge and modern practices have been combined successfully. [Anastasios Kentarchos, Belgium]	Noted. Section and titles have been reorganized and renamed. Examples given.
1605	27	8	27	35	Sustainable land management decisions – The UK government could make new plans to devise a portfolio of policy instruments – specifically financial and human resource-related ones – for UK businesses to use. Here, such instruments could include, but are not limited to: loans, tax measures & financial support – to specifically motivate UK employers & employees to ‘go green’. Much research is being done in this new field – of green human resource management (HRM) – which myself & others can advise you on. [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	Noted. SPM revised and many policy instruments substantiated in the chapters referenced here.
32961	27	12	27	13	Adaptive management is rather unhelpful jargon -- some more descriptive language would be better, in particular for a public-facing document. [Doreen Stabinsky, United States of America]	Accepted. SPM has been built out on specific policies and decision making for adaptive management.
14599	27	12	27	18	The inclusion of Indigenous peoples, Knowledge holders, and governments should be mentioned here. The inclusion of Indigenous peoples in decision-making is an important component of sustainable land management. [Canada]	Noted. Inclusions of 'people' in decision making above. Importance of indigenous knowledge outlined in SPM.
24631	27	12	27	18	The need for a framework to enable stakeholder engagement should be highlighted; how this is achieved is the challenge [Ireland]	Noted. Importance of stakeholder engagement outlined in SPM.

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32409	27	12	27	18	The summary for policy makers is shockingly gender-blind and should, as a minimum, reflect the findings in Chapter 1 (1.5.2) and Chapter 7 (especially Cross-chapter Box 6) more in detail. [Simone Lovera-Bilderbeek, Paraguay]	Accepted. Gender a part of SPM.
40345	27	14	27	18	the "multiple actors" in this sentence overlap: people, farmers, communities, etc. Either delete examples to simplify sentence or clarify and reduce the categories. Similarly, under "sectors" these aren't really sectors...disaster response is an activity, food systems are a system not a sector (agriculture is a sector). Time scale examples seem ok. [Koko Warner, Germany]	Accepted. SPM revised.
24249	27	15	27	15	insert after governments, civil society, media and private stakeholders [Kamal Djemouai, Algeria]	Noted. SPM has been significantly revised.
26265	27	17	27	17	The list in parenthesis is written as if it is exhaustive. However, for the slow onset events sea level rise is missing. Please reformulate. [Luxembourg]	Accepted. SPM has been revised.
3981	27	19	27	19	Write: "A portfolio that includes regulatory, policy instruments ... ". [Switzerland]	Accepted. SPM has been revised.
38429	27	19	27	22	These statements are prescriptive and inappropriate for an IPCC report. [United States of America]	Accepted. SPM has been revised.
32411	27	19	27	25	The observation is important, but it would be important to highlight the importance of respecting Indigenous peoples' and local communities collective land governance systems as well, in line with the findings in Chapter 7 (7.6.5.1 and 7.6.5.3) [Simone Lovera-Bilderbeek, Paraguay]	Noted. Differing contexts noted in SPM.
22145	27	19	27	25	C4.2-Please check: Please provide confidence statement. [Suvadip Neogi, India]	Accepted. SPM revised and confidence language provided.
22147	27	19	27	25	C4.2-Kindly check: Developed and developing nations have different capacities and show different approaches, responsiveness in context of their economy. Please address this issue. [Suvadip Neogi, India]	Noted. Differing contexts noted in SPM.
23125	27	21	27	22	Such portfolios do not necessarily prevent elite capture [Anastasios Kentarchos, Belgium]	Accepted. SPM revised and term deleted.
3983	27	21	27	22	Is the expression "elite capture" clear to all readers? [Switzerland]	Accepted. SPM revised and term deleted.
38431	27	21	27	22	The term 'elite capture' may be unfamiliar to some readers. Perhaps a qualifier is needed: 'Such portfolios would prevent elite capture of [what?] and ensure inclusive meaningful participation.' Either that or the term 'elite capture' could be replaced with a more general phrase or basic definition. [United States of America]	Accepted. SPM revised and term deleted.
13467	27	21	27	23	What is meant by "elite captive"? [Lourdes Tibig, Philippines]	Accepted. SPM revised and term deleted.
31599	27	22	27	23	Unclear: what is meant by "elite capture"? Capture of what? Who constitutes "elite"? Replace whole sentence with: "Such portfolios will ensure inclusive meaningful participation, allowing for universal access to opportunities and development, preventing limited unilateral support." [Brazil]	Accepted. SPM revised and term deleted.
38433	27	22	27	25	The phrases, "procedures that avoid exclusion" and "address informal coping strategies that result in maladaptation" are challenging to follow and redundant. Consider simplifying the sentence to read, "Avoiding processes that marginalize communities, and involving local people in natural resource decisions and management, can enhance the delivery of natural resource services. Such actions can also reduce maladaptation brought on by informal coping strategies." [United States of America]	Accepted. SPM revised.
23127	27	26	27	30	Paragraph C 4.3. is similar with paragraph C 4.1. It should be merged or linked to each other. [Anastasios Kentarchos, Belgium]	Accepted. SPM revised.
1607	27	26	27	30	Actions taken by multiple actors – [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. SPM revised.

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1609	27	26	27	30	Action to address the educational & economic barriers to implementation could be taken by the UK government working with key stakeholders in the field – like myself & others. For example, the Bangladesh community in Nottingham has a local language school run by volunteers which I have attended, that could be a role-model mechanism by which to spread the word of educational greening more widely in the UK. Additionally, research I am scheduled to do at Nottingham Business School with other UK colleagues on how to tackle the migration of Bangladeshi climate change (flood) agricultural refugees through Tripoli & Italy into the UK could be useful here too. For example, we are looking to provide policy options to the Bangladesh & Indian governments on such policy options concerning how to keep such workers located there, and not to migrate overseas, plus how to up-skill worker knowledge & abilities to stop them becoming unemployed and marginalised citizens in either their country of origin or their end country destination, e.g. the UK. As Bangladesh nationals are the largest migrating group into the European Union now - we are interested to work with the UK government on how to manage such migration flows more sustainably. [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	Noted. Helpful suggestions on future activities.
3985	27	26	27	30	Paragraph C4.3 is too generic. Improve it. [, Switzerland]	Accepted. SPM revised.
22149	27	26	27	30	C4.3-Please check: Actions taken by actors and barriers to implementation are highly variable and context specific-this should be addressed [Suvadip Neogi, India]	Accepted. SPM revised.
31601	27	28	27	28	including consumers, farmers, land managers,... [, Brazil]	Accepted. SPM has been revised.
4965	27	28	27	30	In light of the executive summary of chapter 6 (page 4, line 28 – 36), "business" could also be mentioned as one of the actors involved in effective coordinated action. [, Japan]	Accepted. SPM revised.
12617	27	30	27	30	Suggested addition at the end of the paragraph: At the same time, in industrialised, high-income countries, the transition to healthy, low-carbon diets will require measures by governments, such as regulation and taxation. Studies suggest that consumers expect such leadership, and that governments tend to overestimate the extent of a backlash in interventions in dietary options. (Chatham House, 2015) (Chatham House (2015) Changing Climate, changing diets: Pathways to Lower Meat Consumption) [Carina Millstone, United Kingdom (of Great Britain and Northern Ireland)]	Noted. SPM has been revised. Literature referred to chapter 5.
14601	27	31	27	31	See comment above regarding the use of 'distilled' in reference to Indigenous Knowledge. Same input applies here. [, Canada]	Noted.
6141	27	31	27	32	"Low" confidence will better than "medium" taking into account the population dynamics issue. In general, population is still increasing today, and the solutions, indigenous and local knowledge distilled into traditional agroecological practices in the past will not be in adequation with the new population dynamics... [Jacques-Andre Ndione, Senegal]	Noted. SPM has been revised
24633	27	31	27	34	Some indigenous practices are not sustainable, eg. On biomass burning. How to address these should also be included. [, Ireland]	Rejected. SPM covers new knowledge in chapter based on peer reviewed literature. This is a gap in knowledge.
26009	27	31	27	35	The way this is written could suggest that agroecological practices are different from modern agronomic practices, where agroecology is part of modern agronomic practices. [, France]	Accepted. SPM section revised and this reference deleted.
20915	27	31	27	35	The first sentence should again say modern agroecological practices. The 2nd sentence seems to repeat what the first sentence meant to say, which then repeats a previous paragraph. (p25 line 19) [, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. SPM section revised.

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20917	27	31	27	35	This appears to be making the same points as C2.5 - consider deleting or rephrasing for clarification. [, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. SPM section revised.
13469	27	31	27	35	Please highlight gender and equality. [Lourdes Tibig, Philippines]	Accepted, Gender is included in SPM>
29763	27	31	27	35	It is positive to see acknowledgement of traditional, indigenous and local knowledge here. [Tanya Smith, Canada]	Noted.
26011	27	33	27	35	We suggest to rephrase as following: "Agroecology, with innovative combinations of indigenous and local knowledge and modern agronomic practices, by relying on biochemical cycles and by a sustainable use of biodiversity, can contribute to overcoming combined challenges of climate change and desertification" [, France]	Noted. SPM revised and agroecology deleted.
15929	27	36	27	39	Very important. See reamrk on page 25 sectionC2.6 [Caroline Vincke, Belgium]	Noted.
7285	27	36	27	39	An assessment of this bullet point is required. [Debra Roberts, South Africa]	Accepted. SPM revised and confidence language provided.
1611	27	36	27	39	Decision-making & policy design – [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	Noted. SPM revised and section no longer exists.
1613	27	36	27	39	The UK government might engage more in co-development monitoring with other countries to help minimize the consequences of droughts & floods on affected people, e.g. those just mentioned in C4.3. above. [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	Noted.
11655	27	36	27	39	IPCC certainty language is missing [Linah Ababneh, Sweden]	Accepted. SPM revised and confidence language added
13325	27	36	27	39	C5. Tackling the complex challenges associated with climate change and land interactions will require innovative approaches to decision-making and policy instrument design, including codevelopment and participatory approaches, mechanisms to ethically consumption as well as improved monitoring reporting and verification practices. {1.3.1, 1.4.1, 1.4.2, 7.5.6, 7.6.5} [Marina Rosales Benites de Franco, Peru]	Noted. SPM section revised.
22151	27	36	27	39	C5: Kindly check: Please provide confidence statement. [Suvadip Neogi, India]	Accepted. Spm revised and confidence language provided.
25049	27	38	27	39	For instance, how to monior, report and verify(MRV) the benefits/impacts of sustainable land management (SLM) practices on adaptation and mitigation? [Binaya Shivakoti, Japan]	Rejected. MRV has been substantially revised and this detail beyond the scope of this report.
38435	27	40	27	42	What does it mean for a policy instrument to "address ... zero net land degradation"? [, United States of America]	Noted. SPM revised and redrafted.
23129	27	40	27	45	C5.1's pairing of intended outcomes (e.g. minimise hazards) with policy approaches that can achieve them (safety nets, social protection schemes...) is quite effective. Perhaps this approach could be copied in other parts of section C in order to provide more detailed and practical insights in a concise manner. [Anastasios Kentarchos, Belgium]	Noted. SPM substantially revised and this retained.
32847	27	40	27	45	Early warning systems that are relevant and necessary go beyond hydrometeorological warnings. FEWS -- famine early warning systems -- should be included in the broader category and discussion. [Doreen Stabinsky, United States of America]	Accepted. Early warning systems SPM expanded.
3051	27	41	27	42	'zero net land degradation': definition is required. [, Russian Federation]	Accepted. SPM revised and term deleted.
17615	27	41	27	42	What does "zero net land degradation" imply? It would sound that land degradation will still occur somewhere, which may not be a proper response. [, Sweden]	Accepted. SPM revised.
8767	27	41	27	42	zero net land degradation proved an uncomfortable term for some parties to the UNCCD. Suggest sticking with land degradation neutrality, which has been adopted and defined [Jean-Luc Chotte, France]	Accepted. SPM revised.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
8811	27	41	27	42	We encourage you to replace the term "zero net land degradation" (older term) with the current term "land degradation-neutral world" (see SDG 15.3). The term land degradation neutrality is also used in the other recently published reports of other UN bodies (e.g. IPBES land degradation and restoration and UNCCD scientific Conceptual Framework for Land Degradation Neutrality, and the UNCCD Global Land Outlook report). Regarding use of these terms, please also check chp. 3 and (e.g. chp. 4, p. 60, L13-37). [Jean-Luc Chotte, France]	Accepted. SPM revised.
8775	27	42	27	44	As written now, the wording in this sentence, imo, implies that policy instruments can minimize drought, the hazard itself. Shouldn't the implication state that policy instruments can help minimize the affects (e.g. impacts) of drought? I would steer clear of implying that we can "drought proof" ourselves, rather we can reduce our risk through mitigation actions. [Jean-Luc Chotte, France]	Accepted. SPM revised.
3987	27	44	27	44	Why are "taxes" mentioned here? [, Switzerland]	Accepted. SPM revised.
827	27	36	28	2	these paragraphs don't include any confidence levels. Either they are updated or the paragraphs should be deleted. [, Spain]	Accepted. SPM revised and confidence language added
22155	27	36	28	2	C5 and C5.1-Please check: The contribution of different countries (developed vs. developing) to climate change, and their capacity to prevent and cope with its consequences, varies enormously. Provision of financial resources should aim to achieve a balance between adaptation and mitigation, taking into account country-driven strategies, and the priorities and needs. These issues need to be addressed. [Suvadip Neogi, India]	Rejected. SPM provides new knowledge. Details requested by country are beyond scope.
24251	27	36	28	10	MRV practices can be very spread and not useful as suggested. There maybe a need to clearly refer to the existing Climate MRV system(s) and/or to suggest, as a result (or recommendation) of such important IPCC special report (SRCCL) a specific SLM/Deserts MRV system (to be developed) and that is linked to climate change, biodiversity, SDGs,... [Kamal Djemouai, Algeria]	Accepted. MRV substantially rewritten and this reference deleted.
30937	27	36	28	10	C5.1 underlines that action on land addressing climate change require "co-development and participatory approached, but it is not elaborated in the subsequent paragraphs, which only focus on economic measures. Understanding the fundamental important of land tenure rights and good governance in the effectiveness of any future policy is critical (see 1.3.1.5, 4.10.4 and 6.2.2.2). Blackman, A. & Veit, P. (2018) Titled Amazon Indigenous Communities Cut Forest Carbon Emissions: Ecological Economics: 15356–67 Available from: https://linkinghub.elsevier.com/retrieve/pii/S0921800917309746 and Stevens, C. et al. (2014) Securing Rights, Combating Climate Change: How Strengthening Community Forest Rights Mitigates Climate Change - Rights and Resources Initiative. Available from: https://www.wri.org/sites/default/files/securingrights-full-report-english.pdf [Kelsey Perlman, France]	Accepted. SPM revised and details provided. References referred to chapters.
32963	27	40	28	1	These are very odd groupings of examples in parentheses that don't seem at all accurate. [Doreen Stabinsky, United States of America]	Accepted. SPM revised. This statement deleted.
22153	27	40	28	2	C5.1-Kindly check: Please provide confidence statement. [Suvadip Neogi, India]	Noted and Accepted. Confidence language revised in the SPM final draft.
6345	27	42	28	2	In order to understand this paragraph the reader needs prior knowledge or to have read the underlying chapters, as there is a lot of technical terminology. E.g. what are 'transferable development rights'? Why do some of these instruments apply only to floods and not to droughts? Would e.g. catastrophe bonds not also be applicable to droughts? [, Gambia]	Accepted. SPM revised and language amended.
38437	27	42	28	2	This statement is policy prescriptive and therefore inappropriate for an IPCC report. It is also written in a way that is difficult to understand. [, United States of America]	Accepted. SPM revised.

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13471	27	42	28	2	Improve on the way the different policy instruments are presented. To address the different hazards. [Lourdes Tibig, Philippines]	Accepted. SPM revised.
32957	27	1			which commodities? Food? Soy? Palm oil? [Doreen Stabinsky, United States of America]	Noted. Section C is revised. See Sections B1-B7, C4 and D2 in the revised draft
5329	27	7			The following wording is suggested: Sustainable land management strategies often require upfront investment as benefits for communities and for climate change adaptation and mitigation only accrue over longer time frames in the range of decades. [Klaus Radunsky, Austria]	Noted. Section revised
15927	27	10			long term collaboration [Caroline Vincke, Belgium]	Noted. Section has been revised. LDN covered in other sections.
2113	27	27			Robust Evidence/high agreement [Tomas Molina, Spain]	Accepted. SPM revised.
32955	27	31			indigenous and local knowledge are certainly important sources and contributions to agroecological practices but this wording misinterprets the relationship. See comments made on the underlying chapter and references cited, in particular Atlieri et al. 2015. Agroecology and the design of climate change-resilient farming systems. [Doreen Stabinsky, United States of America]	Accepted. SPM section revised and this reference deleted
28723	27				C3.4: Reduction of demand for agricultural commodities..." This is key - and should be highlighted. Once again, if the substance of this statement is considered true, then technologies that would require vast biomass supplies both from forest and agricultural lands, should be excluded, not promoted (bioenergy, BECCS and biochar) [Rachel Smolker, United States of America]	Noted. Section revised
15309	28	1	28	1	Suggest augment the list of instrument designs that achieve GHG mitigation to include the reform of policy instruments with perverse incentives or unintended consequences - eg "and achieve GHG mitigation (financing mechanisms, carbon pricing, technology transfer and the reform of production subsidies with perverse incentives)." [, Australia]	Accepted. SPM revised. This statement deleted.
4967	28	3	28	3	Additional explanation of "sustainability criteria" is necessary. [, Japan]	Accepted. SPM has been revised.
829	28	3	28	3	what does this paragraph mean by "sustainability of global trade of land"? Please redraft this to make it understandable, or delete "of land and" from the sentence. It would then read "criteria are considered in the global trade of land based commodities". [, Spain]	Accepted. SPM revised and term deleted.
3053	28	3	28	4	The statement is unclear. [, Russian Federation]	Copy edit to be completed.
23131	28	3	28	10	This statement should be re-written in a less policy-prescriptive manner. The core scientific observations appear to be that global trade can contribute to food security, land restoration and climate change mitigation and adaptation in some circumstances, but that action (without prescribing exact policies) is also needed to ensure it does not exacerbate these phenomena. [Anastasios Kentarchos, Belgium]	Accepted. Section has been rewritten.
15181	28	3	28	10	The sustainability tradeoff of making food more expensive seems to have been overlooked here. [Daniel Zarin, United States of America]	Accepted. SPM has been revised. Response options and tradeoff findings of the report have been provided in greater detail.
1615	28	3	28	10	Here, I wonder what collaborations the UK government have with UK-based agri-businesses to help tackle this problem? [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	Noted.
16487	28	3	28	10	What are the options for pursuing both mitigation and adaptation? Synergies for both actions should be addressed more. [, Republic of Korea]	Accepted. Response options and tradeoff findings of the report provided in greater detail.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
38439	28	3	28	10	The paragraph suggests that, if only policymakers considered sustainability criteria, vulnerabilities to climate and socio-economic changes would be easily reduced. Local food and energy supply are generally not controversial objectives. Restating them is not helpful to policymakers without specific information on options for enabling environments. [, United States of America]	Noted. SPM has been significantly revised. Paragraph amended.
12619	28	4	28	4	Suggested addition after: 'If sustainability criteria are considered in the global trade of land and land-based commodities, vulnerabilities to climate and socio-economic changes can be reduced.': Further research is needed to understand how sustainability criteria can be integrated alongside other considerations, such as commercial viability and profit seeking. [Carina Millstone, United Kingdom (of Great Britain and Northern Ireland)]	Noted. SPM has been significantly revised. Paragraph amended.
32965	28	4	28	6	There is nothing in the underlying chapter that provides evidence for the sentence beginning "Both local action and global trade..." Delete. [Doreen Stabinsky, United States of America]	Accepted. SPM and paragraph revised.
5485	28	4	28	6	It is not clear how could global trade enhance local food supply. [, Hungary]	Noted. SPM has been significantly revised. Paragraph amended and definitions clarified.
30935	28	4	28	6	"local global trade in agriculture and forestry commodities can enhance local food, timber or bioenergy supply and thus also contribute to food security and land restoration (very high confidence)" Unsure what scientific claim this is defending, as commodity trade can also lead to land degradation. [Kelsey Perlman, France]	Accepted. SPM has been revised.
32413	28	4	28	6	The sentence about local action and global trade makes no sense the way it is written. [Simone Lovera-Bilderbeek, Paraguay]	Copy edit to be completed prior to publication.
32967	28	6	28	9	internalizing the cost of carbon contributes to ensuring a stable food supply? In what way? This statement doesn't make sense. Delete. [Doreen Stabinsky, United States of America]	Accepted. SPM paragraph has been revised.
27697	28	6	28	10	Page 1-39 states that market instruments are not effective, how does this compare with the statement on internalisation of costs in the SPM? Please check. This is a potential contradiction. [, Germany]	Accepted. SPM has been revised.
4969	28	6	28	10	Regarding the part "policies that allow internalization of the cost of carbon", we would suggest clarifying what "the cost of carbon" means. If it means not only carbon price but also the other cost, we would suggest to replace it to "policies that allow internalization of the costs of carbon and other vital resources such as water, nutrients" Regarding the sentence "Internalizing the full costs of land and (...)", we would also suggest clarifying the methods of cost estimation since the detailed information of cost estimation is critical for policy making. [, Japan]	Accepted. SPM paragraphs on cost have been revised.
38441	28	6	28	10	The statement appears to rely on a single study; is the confidence level sufficient to merit inclusion in the SPM? [, United States of America]	Accepted. SPM revised and confidence language checked.
15533	28	7	28	7	Remove comma so that it reads: "climate mitigation and adaptation will benefit". [Annika Herbert, South Africa]	Copy edit to be completed prior to publication.
26091	28	7	28	7	Change "will" to "would" [Reid Detchon, United States of America]	Copy edit to be completed prior to publication.
3989	28	9	28	9	Write: "... as biodiversity and ecosystems, water ...". [, Switzerland]	Noted. Sentences revised in the final draft.
24685	28	9	28	10	Practical guidance on achieving the internalisation of costs should be provided [, Ireland]	Noted. Peer reviewed literature in chapter inform the spm.
14517	28	9	28	10	The important value of absorption (sequestration, sink) capacity of carbon dioxide in relation to land management is not evaluated fairly yet, although REDD plus has been discussed so long. If there were such reference with evidence, it is better to stress necessity of internalise carbon minus value. [Shuzo Nishioka, Japan]	Noted. SPM has been revised and response options for land and climate elaborated.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
12621	28	10	28	10	Suggested addition at the end of the paragraph: Further research is needed to understand the feasibility of cost internalisation of environmental impacts in agricultural products, that is to say, how to operationalise the transition to a market where price both reflects land and natural resource degradation and supply and demand. [Carina Millstone, United Kingdom (of Great Britain and Northern Ireland)]	Noted. SPM has been significantly revised and this paragraph rewritten.
3991	28	10	28	10	Write: "... resource degradation and paying for restoration.": [, Switzerland]	Noted. SPM has been significantly revised and this sentence deleted.
38443	28	10	28	10	Section 7.5.6 does not appear to be relevant to C5.2. [, United States of America]	Noted. SPM revised and sections checked.
6675	28	13	28	15	"D 1.2. Many "no regrets" response options which have multiple benefits in terms of desertification, 14 land degradation, food security, and climate mitigation and adaptation (e.g., improved health through 15 improved diets) are low cost,...". One may wonder if the cost is truly "low", considering under situations whereby governance is weak there are rent seeking behavior that will incur serious transaction costs [Mochamad Indrawan, Indonesia]	Noted. SPM has been ignificantly revised to reflect peer reviewed literature of response options, synergies and tradeoffs.
15931	28	4			local action: ok! [Caroline Vincke, Belgium]	Noted.
2073	28	6			Very high [Tomas Molina, Spain]	Copy edit to be completed prior to publication.
15933	28	10			and also work on firms accountability for pollution and land degradation? Does this appear somewhere in the document? [Caroline Vincke, Belgium]	Noted. Individual actor's accountability beyond the scope of the report.
23281	28	10			What are 'land products' ? Perhaps use 'land-based products from ecosystem services including food' ? [Mark Howden, Australia]	Copy edit to be completed prior to publication.
28725	28				C5.2. The statement that global trade in agricultural and forestry commodities can enhance local food, timber or bioenergy supply and thus contribute to food security and land restoration (very high confidence) is unfortunate in light of booming global trade in wood pellets for bioenergy which is resulting in degredation of forests in sourcing areas in the southeastern USA and British Columbia among other source locations. Furthermore, the global trade in ag and forestry products is resulting in escalating problems with introduction of pests and invasive species. This has not been identified and this statement needs to reflect. [Rachel Smolker, United States of America]	Noted. SPM has been significantly revised and this paragraph rewritten.
15155	29	1	29	26	The section on what can be done immediately seems to highlight addressing primarily desertification, whereas presumably there are many near term opportunities, including in temperate countries where desertification is not an issue. Is there somore more systematic way that immediate opportunities could be presented? [Maya Hunt, New Zealand]	Noted. Addressed. Text revised and restructured considering this point and updated in the FD, vide pp 29 line 1 - pp 29 line 37.
15157	29	1	29	26	Is there potential here to include a section on "win-win" opportunities, or opportunities for immediate positive synnergies? Eg, take up of material substiuon of fossil fuels, steel and concrete with sustainably produced timber? More generally, should material substitution receive a greater focus throughout? [Maya Hunt, New Zealand]	Noted. Text revised and restructured, vide pp 29 line 1 - pp 29 line 37-updated in the FD.
17429	29	2	29	2	This section does not highlight the role of indigenous and local community rights to protect forests enough and should address the various ecosystem restoration measures in more details. [Taehyun Park, Republic of Korea]	Noted. Text revised and restructured in the FD, vide pp29 line 1 - pp 31 line 5.
24635	29	3	29	3	This opening statement is not appropriate [, Ireland]	Addressed. Please vide pp29 line2 - pp29 line4 in the FD for revised and restructured text.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
4971	29	3	29	3	The first sentence ("Enough is known to take action now.") seems to imply some value judgements. We would suggest providing some samples of specific actions that are evaluated in the underlying literature. Otherwise, the sentence could be started from the second sentence as it can stand alone. [, Japan]	Noted. Addressed. Text revised and restructured in the FD considering the comment, vide pp29 line 1 - pp 31 line 5.
17617	29	3	29	3	The first sentence would seem to be out of scope, as it is a kind of a valuation statement. [, Sweden]	Noted. Addressed. Text revised and restructured in the FD. Kindly vide pp29 line2 - pp29 line6.
3993	29	3	29	3	Write: "Enough is known to action now. Some actions may need to be long-lasting for achieving their goal, and this message has to be conveyed by the report in the SPM. [, Switzerland]	Noted. Addressed. Text revised and restructured in the FD considering the comment, vide pp29 line 1 - pp 31 line 5.
38449	29	3	29	3	The opening sentence is a bit too vague for inclusion in the SPM. [, United States of America]	Addressed. Please vide pp29 line2 - pp29 line4 for revised and restructured text in the FD.
26013	29	3	29	4	This message is highly important, the SPM should provide clear and detailed examples of the options that are cost effective and ready for implementation and take into account the sustainable development needs, and the SPM should refer clearly to a section of the report where even more details are available. [, France]	Noted and addressed. Please vide pp29 line1 - pp31 line5 in the FD for revised and restructured text.
22157	29	3	29	5	D1-Please check: Cost-effective options.....what are those options? Please specify. The options are highly context specific. Please address. [Suvadip Neogi, India]	Noted. Please find pp 29 line2 - pp 31 line 5 in the FD for revised and restructured text.
32683	29	3	29	16	The present text is not specific. If there are so many no-regret options, why not give more examples? This will be more useful to policymakers than additional general considerations. [Jean-Pascal van Ypersele, Belgium]	Noted and addressed. Please vide pp29 line1 - pp31 line5 in the FD for revised and restructured text.
24447	29	3	29	26	Section D.1 lacks inclusion of concrete measures or examples. It is too vague and general. [, Belgium]	Noted. Please find pp 29 line1 - pp 31 line 5 in the FD for revised and restructured text.
17431	29	3	29	26	Section D1 fails to explicitly list no regret options not requiring additional land and combining significant mitigation potential with adaptation, biodiversity and other benefits such as eliminating deforestation and forest degradation, natural forest management or wildfire prevention and control [Taehyun Park, Republic of Korea]	Noted and addressed. Text revised and restructured in the FD considering the comment, vide pp29 line 1 - pp 31 line 5.
26015	29	6	29	6	« Technological » is not necessary here and may be misleading. The sentence should also include nature-based solutions. [, France]	Noted and addressed. Kindly vide Sec D (pp29 line1 - pp 31 line5) in the FD for revised and restructured text.
26267	29	6	29	6	Should existing scientific innovations also be included in the list? [, Luxembourg]	Noted. Please vide Sec D in the FD.
6055	29	6	29	6	Delete technological, as not all solutions are technological, such as afforestation. [, Poland]	Noted. Please vide Sec D in the FD.
31603	29	6	29	7	based on known sustainable practices, new scientific innovations and indigenous and local knowledge,,,, (comment: it is not only new knowledge or ITK that is needed. There is a large knowledge background on sustainable agriculture that is already developed, based on solid theoretic, technical and empiric evidence that should not dismissed.) [, Brazil]	Noted and addressed in the FD. Please vide Sec B, C and D.
23133	29	6	29	8	"Site-specific technological solutions, based both on new scientific innovations and indigenous and local knowledge, are available to avoid, reduce and reverse desertification, simultaneously contributing to climate change mitigation and adaptation (high confidence)." Why is desertification mentioned but degradation is not? There are also site-specific solutions to avoid, reduce and reverse degradation and to ensure or increase food security. [Anastasios Kentarchos, Belgium]	Noted. Text revised and restructured, considering this point and updated in the FD, vide pp 29 line 3 - pp 29 line 12.
40343	29	6	29	8	Sentence is long and hard to understand--you could divide into two sentences. Kindly simplify to make the main message more clear (solutions are available that simultaneously reduce GHGs and contribute to adaptation) [Koko Warner, Germany]	Noted. Text revised and restructured, considering this point and updated in the FD, vide Section D1 .

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24637	29	6	29	12	There are a lot of strong statements which do not add information for policy makers - this style of writing should be avoided. The information, data and analysis provided should make the case for action. Specific information would be more useful here [, Ireland]	Noted and addressed. Please vide revised and restructured text under Sec D in the FD.
24693	29	6	29	12	This paragraph can be applied to other land degradation and ecosystem restoration. Inclusion of this point is warranted [, Ireland]	Noted. Text revised and restructured in the FD. Please vide pp29 line1 - pp 31 line5 (Sec D) and also Sec C.
30407	29	6	29	12	D1.1 Why would this only apply for reversing desertification? Please include land degradation and deforestation and natural ecosystems degradation [, Netherlands]	Addressed. Text revised and restructured, please vide pp 29 line 1 - pp 31 line 5 in the FD.
16491	29	6	29	12	What are no regret options? No regret options for land should be addressed first. [, Republic of Korea]	Noted. In the FD text has been modified and restructured, please vide pp29 line 1 - pp31 line5.
29957	29	6	29	16	What are these technological and no regret options that are available now and are proven to work? [, Estonia]	Noted and addressed. Please vide Sec D, C and B in the FD.
20921	29	6	29	16	The final sentence of D1.1 ('There is little risk... no regrets options') could be moved into D1.2 so that D1.2 specifically focusses on no regrets options. [, United Kingdom (of Great Britain and Northern Ireland)]	Noted. Addressed. Text revised and restructured, vide pp 29 line 1 - pp 29 line 37.
32415	29	6	29	16	Halting deforestation by 2020, in line with SDG 15.2, and natural forest restoration should definitely be mentioned as low cost, short-term no regrets response options, in line with the findings of Chapter 2 (2.6.2.1). [Simone Lovera-Bilderbeek, Paraguay]	Noted and addressed in the FD. Please vide pp29 line1 - pp 31 line 5 and pp23 line1 - pp26 line 34.
831	29	7	29	7	we don't believe that technological solutions should be based only on new scientific innovations and indigenous and local knowledge, there are other options. Therefore, we ask to replace "both" by "for example". Sentence would then read "Site-specific technological solutions, based for example on new scientific innovations and..." [, Spain]	Noted. Addressed. Text revised and restructured in the FD. Please vide Sec D, C and B (pp14 line1 - pp31 line 5)..
3995	29	7	29	7	Write: " ... and reverse anthropogenic desertification ...". [, Switzerland]	Noted. No action needed.
20923	29	10	29	12	these two lines could be added to d1.2 [, United Kingdom (of Great Britain and Northern Ireland)]	Noted. Addressed under Sec D in the FD. Please vide pp 29 line1 - pp31 line5.
24255	29	11	29	11	please consider adding after "implementation plans" to following "and secure adequate mobilization and provision of financial, technology and capacity building supports", which is something very important for decision makers under such SPM. [Kamal Djemouai, Algeria]	Noted. Please vide pp 29 line1 - pp31 line5 under Sec D in the FD.
833	29	13	29	14	ad "reducing" before desertification and land degradation in lines 13 and 14, and "enhancing" before "food security" in line 14. [, Spain]	Noted. Please vide pp 29 line1 - pp31 line5 under Sec D in the FD.
33005	29	13	29	15	Many "no regrets" response options which have multiple benefits in terms of reversing desertification, land and ecosystem restoration, limiting biodiversity loss, improving food security, and climate change mitigation and adaptation (e.g., improved health through improved diets) are low cost, with some even being cost negative (robust evidence, high agreement). [Christopher Pereira, Canada]	Noted. Addressed. Please vide revised and restructured Sec D, C and B (pp 15 line1 - pp31 line5) in the FD.
26017	29	13	29	15	Especially the "no regret options" should be detailed, the policy makers need to get quickly informations on those. [, France]	Noted. Text revised and restructured in the FD, please vide pp15 line1 - pp31 line5.
30149	29	13	29	15	This statement overlaps with statement C3.2. More in general: it is not easy to read sections C and D. Statements are very general and abstract containing a lot of overlapping information. It might be worth while to improve readability. [, Netherlands]	Addressed. Text revised and restructured, please vide Sec C (pp 23 line 1 - pp28 line 24) and D (pp29 line1 - pp31 line5) in the FD.
23135	29	13	29	16	Please include: Multiple benefits in terms of combatting desertification, halting and reversing land degradation and biodiversity loss, increasing food security, climate change mitigation and adaptation ... (eg improved health through improved diets; increased resilience through ecosystem conservation and restoration) [Anastasios Kentarchos, Belgium]	Noted. Text revised and restructured in the FD. Please vide Sec D, C and B (pp15 line1 - pp31 line5).
13137	29	13	29	16	Add reference to biodiversity [David Cooper, Canada]	Noted. No action needed. Text revised and restructured under Sec D in FD.

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24639	29	13	29	16	Surely land restoration would be a clearer and more quantifiable no-regrets policy [, Ireland]	Noted. Addressed. Text revised and restructured in the FD. Please vide pp23 line1 - pp28 line24 and pp29 line 1 - pp31 line 5.
4973	29	13	29	16	As the specific examples of "low cost" or possibly "negative cost" options, "improved health through improved diets" is mentioned. However, the definition/scope of this "cost" is not clear. We would suggest including not only direct cost, but also the hidden cost (opportunity cost, for example, in economics). In the main text, there is no straightforward expression such as "low cost" or "negative cost", although it is shown that "benefits" of improved health through improved diets can exceed its "direct costs" (Ch.5, p.5-71, L18-30, and Ch.7, p.7-31, L41-45). Most importantly, the main text specifies that the whole cost of achieving improved health through improved diets can be "high", rather than "low", by stating that "diets are deeply culturally embedded and behavior change is extremely difficult to effect, even when health benefits are well known; Macdiarmid et al., 2016" (Ch.6, p.6-84, L2-5, and p.6-84, Table 6.20). Therefore, reconsidering the whole paragraph while explicitly defining the concept of a cost, which seems to be narrowly defined in the current version, is recommended. [, Japan]	Noted. Text revised and restructured, please vide pp15 line1 - pp 31 line 5 in the FD.
23137	29	13	29	23	D1.2 In the case of low-cost or cost-negative options, it would be useful to identify what barriers to uptake have been identified. Similarly for D1.4, if the current practices are low-productivity, and sustainable alternatives bring benefits - what insights can science provide as to why the existing practices persist? [Anastasios Kentarchos, Belgium]	Noted. Addressed. Text revised and restructured in the FD. Please vide pp23 line1 - pp28 line24 and pp29 line 1 - pp31 line 5.
27703	29	15	29	15	..." are low cost, with some even being cost negative": Please explain that negative cost occur only, if barriers to implementation are in place, or information is lacking. [, Germany]	Noted. Addressed. Please vide pp25 line1 - pp25 line 6 and pp29 line34 - pp29 line 37 in the FD for revised and restructured text.
20925	29	15	29	15	Can an example of cost negative options be given here? [, United Kingdom (of Great Britain and Northern Ireland)]	Noted. Text revised and restructured to address the comment. Please vide Sec D (pp 29 line1 - pp31 line5), C and B in the FD.
12623	29	16	29	16	Suggested addition at the end of the paragraph: For example, the prevention of food loss and waste in low-income countries has the potential to immediately contribute to livelihood security. In high-income, industrialised countries, the transition to low-carbon, healthy diets, can lessen the burden on public healthcare systems. Moreover, such a transition is technologically and commercially feasible, and does not require widespread changes to existing infrastructure (unlike the energy, housing and transport transition), making it one of the 'easiest' climate mitigation and adaptation responses for these countries. [Carina Millstone, United Kingdom (of Great Britain and Northern Ireland)]	Addressed. Please vide revised and restructured text of Sec C and D in the FD.
23139	29	17	29	19	This statement is very similar to the findings throughout section C on better policy design and decision making. The issue would be better discussed there. [Anastasios Kentarchos, Belgium]	Noted. Considering the comment, text revised and restructured, please vide pp 29 line 1 - pp 31 line 5 in the FD.
24641	29	17	29	19	Perhaps highlight the need for long term land use scenario development which takes account of climate risks and opportunities [, Ireland]	Noted. In order to address the comment, text revised and restructured, please vide pp 29 line 1 - pp 31 line 5 in the FD.
20927	29	17	29	19	The meaning of D1.3 is unclear, as it is not clear what is meant by 'the dimensions of risk over time and space'. This is not an especially key message and could be removed [, United Kingdom (of Great Britain and Northern Ireland)]	Noted. Addressed. Text revised and restructured in the FD. Please vide pp 29 line 1 - pp 31 line 5.
20929	29	17	29	19	This point is a little vague and I am not sure what the take-home message is from it - is there a way of drawing it out a little more? [, United Kingdom (of Great Britain and Northern Ireland)]	Noted. Addressed. Considering the comment, text revised and restructured, please vide pp 29 line 1 - pp 31 line 5 in the FD.
20931	29	17	29	19	This is rather self-evident and feels superfluous. [, United Kingdom (of Great Britain and Northern Ireland)]	Noted. In order to address the comment, text revised and restructured, please vide pp 29 line 1 - pp 31 line 5 in the FD.

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38451	29	17	29	19	D1.3 lacks a confidence statement and does not appear to be supported by the referenced section of the underlying report. [, United States of America]	Addressed. Text revised and restructured, please vide pp 29 line 1 - pp 31 line 5 in the FD.
38453	29	17	29	19	The sentence is confusing. In addition, trade-offs are not inherently negative. Consider changing to read: "Substantive, emerging and cascading risks can be better understood if we recognize how risk changes over time and space; as well as how it changes when interacting with hazards of climate, land and society. An increased understanding of the nature of risk can help us to optimize synergy, and avoid negative tradeoffs and tipping points." [, United States of America]	Noted. Please find pp 29 line1 - pp 31 line 5 in the FD for the revised and restructured text.
22161	29	17	29	19	D1.3-Please check: Risk mis-management and residual risks leading to tipping points for climate change to be addressed. [Suvadip Neogi, India]	Noted. Considering the comment, text revised and restructured, please vide pp 29 line 1 - pp 31 line 5 in the FD.
13473	29	17	29	20	Is the word "hazard" needed here? [Lourdes Tibig, Philippines]	Noted. Word 'hazard' removed, please vide pp 29 line 1 - pp 29 line 37 in FD.
7289	29	17	29	26	Assessment of these bullet points are required. [Debra Roberts, South Africa]	Noted. Addressed. Please vide pp 29 line 1 - pp 29 line 37 in FD.
835	29	17	29	26	these paragraphs don't include any confidence levels. Either they are updated or the paragraphs should be deleted. [, Spain]	Noted. Addressed. Please vide pp 29 line 1 - pp 29 line 37 in FD.
22159	29	17	29	26	D1.3, D1.4 and D1.5-Kindly check: Please provide confidence statement. [Suvadip Neogi, India]	Noted. Text backed/supported by confidence statements in FD, vide pp 29 line 19 - pp 29 line 37.
14603	29	18	29	19	Usually a 'tipping point' is defined as a characteristic of the system. I think what is meant here is 'preventing the passing of tipping points'. [, Canada]	Noted. Deleted 'tipping points'. Please find pp29 line1 - pp31 line 5 in the FD for revised and restructured text.
4975	29	18	29	19	The definition of "tipping points" seems missing. If there is any definite tipping point around which risks discontinuously change, adding some specific examples would help understanding. [, Japan]	Noted. Deleted 'tipping points'. Please find pp29 line1 - pp31 line 5 in the FD for revised and restructured text.
38455	29	19	29	19	Hard to characterize risk associated with tipping points without detailed quantification of what they are. [, United States of America]	Noted and addressed. For revised and restructured text in the FD please vide pp29 line1 - pp31 line5.
6879	29	20	29	21	The wording and message need adjustment. Slash and burn agriculture in nowhere mentioned in the entire report - so it should not be brought up here. Also shifting cultivation is not analysed in depth, and positive impacts of this practice are also mentioned in the report. The wording is top-down "elimination of land intensive low-productivity practice" It is not sure that the intensive systems that may replace them are more climate friendly as they may well be also input intensive and non-sustainable..... I suggest rewording and to talk of synergies between poverty reduction and transition towards more sustainable land management practices. [Markus Giger, Switzerland]	Noted. Please vide pp29 line 38 - pp 31 line 5 in the FD for revised and restructured text.
1617	29	20	29	23	Potential synergies – [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	Noted. Please vide pp29 line 38 - pp 30 line 9 in the FD for revised and restructured text.
1619	29	20	29	23	Plans to tackle slash & burn agriculture could be further actioned by the UK government, and see them work with either formally registered, or ex-registered, UK-based companies such as Astra-Zeneca, Syngenta, Monsanto (among others), to assess their role in soya farming in countries like the UK, and also overseas in countries such as the USA & Brazil – to help develop an integrated policy response to this issue (D1.4., plus B1.-B5. too). Indeed, the UK government may also usefully help tackle the overharvesting of wood-fuels by working with key players like IKEA. John Lewis and Marks & Spencer and other large branded buyers of such goods on this issue too. [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	Noted. Text revised and restructured in FD, please vide pp29 line38 - pp 30 line9.

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32417	29	20	29	23	Aside from the remarkable contradiction between promoting bioenergy as a climate mitigation option and pointing at reducing woodfuel use as a climate mitigation option, this paragraph is based on outdated assumptions about the negative impacts of slash-and-burn agriculture and local woodfuel use that have been dismissed by contemporary scientific research. There is ample evidence that reducing large-scale agriculture provides far more positive impacts in terms of reducing deforestation and land degradation than reducing slash and burn agriculture and woodfuel use(see for example Boucher, 2011 and Curtis, 2018), even though the reduction of the latter is important from a women's health perspective. The findings in Chapter 4 (4.7.4) should be better reflected here as well. [Simone Lovera-Bilderbeek, Paraguay]	Addressed. Please vide pp29 line38 - pp31 line 5 in the FD for revised and restructured text.
24643	29	20	29	26	Can guidance on how to achieve such synergies be provided? Examples of policy interventions? [, Ireland]	Noted and addressed. For revised and restructured text in the FD please vide pp29 line1 - pp31 line5.
12531	29	21	29	21	Can you nuance this? As stands this risks governments discriminating against Indigenous traditional forest Swidden systems that use fire well and have functioning forest fallows, which are different to large scale degrading slash and burn. The 2 types of system need to be distinguished as we know the use of controlled fire in these systems can also help reduced uncontrolled larger scale wildfires [Davies Penny, United States of America]	Noted. Text revised and restructured, vide pp 30 line 4 - pp 30 line 6.
7287	29	24	29	24	Drop 'SLCFs' as the acronym is not used anywhere else in the SPM [Debra Roberts, South Africa]	Noted. Text revised and restructured in the FD, vide pp 30 line 7 - pp 30 line 7.
1621	29	24	29	26	Land sectors – [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	Noted. Addressed. Please vide pp29 line38 - pp30 line9 in the FD for revised and restructured text.
1623	29	24	29	26	The UK government could consider the introduction of new legislation to further restrict burning & wood-fuel over-harvesting in the UK agricultural sector. [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	Noted. Please vide pp29 line 38 - pp 31 line 5 in the FD for revised and restructured text.
29959	29	24	29	26	There is something missing in this sentence, please revise. Also add confidence etc levels [, Estonia]	Addressed. Please vide pp 29 line 1 - pp 31 line 5 in the FD.
24647	29	24	29	26	This is an important issue which should be more prominent in the report. The totality of impacts of land use change and food production should be considered, not just long-lived GHG impacts [, Ireland]	Noted. Addressed. Text revised and restructured in the FD, kindly vide pp 29 line 1 - pp 31 line 5.
24687	29	24	29	26	This is a reference to activities and the synergies between actions on climate and air quality/health are important and could be clearer [, Ireland]	Addressed. Please vide pp 29 line 1 - pp 31 line 5 in the FD.
11657	29	24	29	26	IPCC certainty language is missing [Linah Ababneh, Sweden]	Noted. Text revised and restructured in the FD, vide pp 29 line 1 - pp 29 line 37.
13475	29	24	29	26	please explain "short-lived climate forcers" as used in this context. [Lourdes Tibig, Philippines]	Noted. No action needed. Short-lived climate forcers can be found at Ch 2-Sec 2.5.
22163	29	24	29	26	D1.5-Please check: What are those SLCFs? Please specify. [Suvadip Neogi, India]	Noted. No action needed. Short-lived climate forcers can be found at Ch 2-Sec 2.5.
4979	29	27	29	27	The first sentence ("Enough is known to take action now.") seems to imply some value judgements. We would suggest starting from the second sentence as it can stand alone. [, Japan]	Partially accepted. Statement revised.
20935	29	27	29	27	Suggest saying "further climate change", again to show climate change has already happened and is significant. [, United Kingdom (of Great Britain and Northern Ireland)]	Noted. Statement now completely revised and restructured.
24645	29	27	29	31	Please provide examples of early action, rather than reiterating standard statements on climate action [, Ireland]	Thank you. This comment has been taken into account in the revisions process.
4977	29	27	29	31	The reference level of "delay" and "immediate" is not clear. We would like to have clearer definition on the terms. [, Japan]	Thank you. This comment has been taken into account in the revisions process.

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13327	29	27	29	31	D2. Delayed action will exacerbate challenges linked to climate change and other pressures, decrease the potential of response options, and deprive all people communities of co-benefits (high confidence). Ample evidence suggests that the cost of inaction, non effective reaction, in mitigation and adaptation, as well as in land unsustainable use exceeds the cost of immediate action in individual countries, regionally, and worldwide. {4.10, 6.5, 7.4.1} [Marina Rosales Benites de Franco, Peru]	Noted. Statement now completely revised and restructured.
25051	29	29	29	31	What are few of the examples showing the cost-benefits figures; For instance dollar spend on DRR and health interventions are not necessarily linked for instance to sustainable land management (SLM) [Binaya Shivakoti, Japan]	Thank you. This comment has been taken into account in the revisions process, in particular references to the chapters where more space and detailed discussion of the underlying literature is provided.
38457	29	29	29	31	This is a sweeping statement that is not really supported by Section 7.4.1. A confidence statement is also needed. [, United States of America]	Thank you. This comment has been taken into account in the revisions process.
4981	29	32	29	32	The reference level of "early" is not clear. An "early" action which foregoes before an optimal time point can lead to negative economic benefits. As the information is important for policy making, we would like to have clearer definition on the terms. [, Japan]	Thank you. This comment has been taken into account in the revisions process.
38459	29	32	29	33	A confidence statement is needed for this sentence. [, United States of America]	Accepted. All statements now have confidence statements.
23141	29	32	29	37	It would be useful to provide more information about the economic benefits of early action. If these benefits are widely dispersed it may be difficult for policymakers to 'see' them (and therefore difficult to justify taking action). In which areas of the economy and/or public expenditure might these benefits be noticed? Over what timescales? One or two examples would help. [Anastasios Kentarchos, Belgium]	Thank you. This comment has been taken into account in the revisions process, in particular references to the chapters where more space and detailed discussion of the underlying literature is provided.
1625	29	32	29	37	Early action – [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	Rejected. This comment is linked to another comment.
1627	29	32	29	37	The UK government might usefully make further, new plans to develop incentives for UK businesses to use brown field sites for new factory, office and retail store locations. [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	Rejected. This comment is not applicable to the section.
16489	29	32	29	37	Early action on food security and disaster mitigation and risk reduction do not linked clearly here. More explanation should be made. [, Republic of Korea]	Accepted. Statement now revised and restructured to divide statements on food security and disaster mitigation and risk reduction.
20937	29	33	29	34	what is a health intervention? [, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Statement now revised to clarify meaning.
38461	29	33	29	35	The sentence assigns the same confidence level (high confidence) to intervention in a wide range of sectors and applications: health, biodiversity, water, soil, recreation. Of the sections referenced, 7.3.3 does not appear to support the statement, and 7.3.4 does not exist. Suggest correcting the reference and providing separate confidence levels for each sector as appropriate. [, United States of America]	Noted. Statement now completely revised and restructured to differentiate between sectors.
38463	29	33	29	35	It's not really accurate that all of the various described interventions offer similar returns on investments in risk reduction. That is an overgeneralization of the text in Section 7.4.1. Moreover, it's unclear why the benefits of health interventions would be relevant here. [, United States of America]	Partially accepted. Text has been revised to note that these interventions offer these returns on average. Text on health interventions has been deleted.
8813	29	35	29	35	We encourage you the replace the term "zero net land degradation" (older term) with the current term "land degradation-neutral world" (see SDG 15.3). The term land degradation neutrality is also used in the other recently published reports of other UN bod [Jean-Luc Chotte, France]	Thank you. This comment has been taken into account in the revisions process.
4983	29	38	29	38	The reference level of "early" is not clear. We would like to have clearer definition on the terms. [, Japan]	Thank you. This comment has been taken into account in the revisions process.

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8771	29	38	29	40	Worth commenting here that actions to avert land degradation (e.g. through adoption of SLM) have been shown to be more cost effective than actions to restore degraded land [Jean-Luc Chotte, France]	Accepted. Text has been revised to show averting land degradation is more cost effective than restoring degraded land.
25053	29	41	29	41	Again how investment in land restoration or rehabilitation in dryland could be counted as sustainable land management (SLM) (if we go by definition). I find the use of SLM to be loose throughout the report. [Binaya Shivakoti, Japan]	Partially accepted. Text has been revised, and the statement now specifically addresses land restoration and rehabilitation.
24691	29	41	29	44	There are costs to maintaining good land quality as well as upfront costs. These should be included in the statement [Ireland]	Partially accepted. Text has been revised and specifically focuses on sustainable land management practices.
30151	29	41	29	44	This statement is almost a copy of statement C3.5. Either remove statement C3.5 or D2.3. [Netherlands]	Accepted. Statements revised to remove duplication.
20939	29	41	29	44	This is a repetition of points made in C3.5 - consider deleting [United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Statements revised to remove duplication.
17827	29	41	29	44	D2.3 is repeating the statement in C3.5 almost word for word. Although the message is relevant to both C and D, at least the wording could change [Quentin Lejeune, Germany]	Accepted. Statements revised to remove duplication.
22165	29	41	29	44	D2.3-Please check: investment (climate finance) towards climate change mitigation and adaptation are context specific. Technological and financial aids/supports from developed to developing nations needs to be addressed. [Suvadip Neogi, India]	Thank you. This comment has been taken into account in the revisions process.
14605	29	42	29	43	The phrase 'the benefits in terms of climate change adaptation and mitigation are delivered over multiple time frames' appears to be unnecessarily complicated. The 'time frame' in question is the one in which climate change occurs i.e. decades to centuries. What is meant is 'the benefits in terms of climate change adaptation and mitigation are delivered over a longer period'. [Canada]	Noted. Section restructured and content changed.
28307	29	42	29	44	This message is missing two critical elements. The first is land degradation neutrality provides a framework within which SLM has the potential to succeed. And the second is the reason for this -- the achievement of LDN requires the creation of an enabling environment including the policies and incentives that make land stewardship more attractive than land sale and that make it possible to scale up and scale out SLM. [Barron Joseph Orr, Germany]	Thank you. This comment has been taken into account in the revisions process.
6881	29	44	29	44	A para could be added that talks about synergies between avoiding adjusting diets in developed countries, reducing subsidies that drive these behaviour (agricultural subsidies, subsidies for fossil fuels) and reducing demand on land. [Markus Giger, Switzerland]	Partially accepted. Integrated in Part C2 in the second draft.
20919	29	1	30	1	Please could you check section D (but also C) for repetition, succinctness and clarity. [United Kingdom (of Great Britain and Northern Ireland)]	Noted. Text revised and restructured in FD in order to address the comment, please vide pp 23 line 1 - pp 31 line 5.
2157	29	1	30	39	Providing secure tenure and other support for Indigenous territories and those of other traditional territories is needed to avoid the decline of social and cultural capital and external threats, which can lead to irreversible loss of climate change mitigation opportunities. [David Kaimowitz, Nicaragua]	Noted. Text revised and restructured in the FD, please vide pp 29 line 1 - pp 31 line 5.

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27699	29	1	30	39	From chapter 5 (Executive summary, 5.5.2.4 and table 5.7) we learned about the significant GHG mitigation potential (up to 10% of yearly GHG) of reducing food waste and consumption of excess food as well as about suitable technologies and policy measures to be applied. We also understood that reducing food waste comes with many synergies with other sustainable development goals, supports the adaptation to climate change and saves a lot of money. To us the reduction of food waste seems like a very interesting short-term entry point. However, in SPM section D we hardly find any mentioning of this mitigation/adaptation option. It is only mentioned in D3.2, where research gaps are indicated. We urge the authors to revise and to prominently include the reduction of food waste in the discussion of section D. [, Germany]	Noted. Addressed. Text revised and restructured in the FD considering the comment, vide pp29 line 1 - pp 31 line 5.
30249	29	1	30	39	For immediate actions, see also Table SPM 2 of the SPM of the Land degradation and Restoration Assessment report of IPBES (2018). [, Netherlands]	Noted. Text revised and restructured in the FD, vide pp29 line 1 - pp 31 line 5.
3055	29	1	30	39	Actually 'opportunities for immediate actions' are not requested by the approved outline; all proposed actions should be properly justified from scientific side as well as in regard to technological, economical and political aspects. [, Russian Federation]	Noted. Text revised and restructured in the FD, please vide pp 29 line 1 - pp 31 line 5.
38445	29	1	30	39	A more policy-neutral title for this section, consistent with the IPCC's mandate to provide information that is not policy-prescriptive, would be "Policy options for desertification, land degradation, food security, and climate change mitigation and adaptation". The section would benefit from conditional tense and a more neutral tone with respect to policy options and actions. For example, the first sentence of headline statement D1 does not contain information unique from that in the second sentence, and has an unnecessarily imperative tone. Another example is the statement in D2.4 "Uncertainty need not present a barrier to immediate decision making ..." A more neutral phrasing would be: "While uncertainty may not be a barrier for some decisionmakers ..." [, United States of America]	Noted. Addressed. Text revised and restructured in the FD in order to address the comment, vide pp29 line 1 - pp 31 line 5.
38447	29	1	30	39	This section reads like a set of recommendations. The IPCC products are mandated to be policy relevant but not policy prescriptive. Suggest removal or significant revision of tone, removal of imperatives, solely using conditional tense, and removing content not specific to climate change. Statements encouraging the development of indicators for sustainable land management step beyond the description of knowledge gaps. [, United States of America]	Noted. Addressed. Text revised and restructured in the FD in order to address the comment, vide pp29 line 1 - pp 31 line 5.
24253	29	1	30	39	The whole section D needs to consider and include paragraphs for decision makers on : Intellectual property Rights (when it comes to innovation and technology transfer), clearly explaining the feasibility and the possibilities for SLM/Deserts, on long term benefits of actions, and on potential sources of fundings. [Kamal Djemouai, Algeria]	Noted. Text revised and restructured in the FD, vide pp29 line 1 - pp 31 line 5.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
27701	29	1	30	40	We appreciate the clarity of statements and the policy relevance of Section D. We however strongly encourage the authors to clear the text of policy prescriptive language and confidence levels need to be added to all key findings. E.g., the first sentence is policy prescriptive, we suggest replacing it by "The scientific knowledge on climate change and land is comprehensive and there is high confidence that immediate action would significantly reduce risks and impacts due to climate change and have strong co-benefits for other policy goals." or some similar formulation. Please reformulate also paragraphs D2.4 (... "need"...) and D3.2, line 16 ("research is needed..."). We also note that the three headline statements of the section D have a focus on financial aspects while the full paragraphs do not. Please reconsider the headlines to better reflect the richness of the findings presented in section D. [, Germany]	Noted. Addressed. Text revised and restructured in the FD considering the comment, vide pp29 line 1 - pp 31 line 5.
1667	29	1	30	43	The society is looking forward to see solution-based suggestions from this report, however, The D part of SPM dose not offer detailed advice and solution. [Chao WEI, China]	Noted. Addressed. Text revised and restructured, vide pp 29 line 1 - pp 31 line 5-updated in the FD.
15253	29	1	30	43	Section D is very general, needs to be more specific/elaborated. [Zhai Panmao, China]	Noted. Text revised and restructured, considering this point and updated in the FD, vide pp29 line 1 - pp 31 line 5.
6349	29	3	30	5	These sections contain highly valuable messages that the SPM should deliver: the existence of no regrets options, the need to act now, the risks of delayed action, and the synergies for sustainable development. It would be nice to see a more explicit reference to sustainable development co-benefits and the SDGs. It would also be helpful to have a few more examples of no regrets options. [, Gambia]	Noted. Text revised and restructured, please vide pp29 line1 - pp 31 line 5 and pp 15 line1 - pp 28 line 24 in the FD.
26269	29	3	30	39	Under the heading " D- opportunities for immediate action" sound policies leading to concrete achievements and best practices might be mentioned. New paradigm such as Land Degradation Neutrality(LDN) and progress in its Traget Setting Program might be underlined, given the willingness of 120 countries participating to this initiative. Another point is capitalize on synergies between sister conventions. Building synergies among Rio conventions must be seen as an opportunity to combat land degradation, climate change and loss of biodiversity and to help people in affected areas in earning their livelihoods. [Ahmet Şenyaz, Turkey]	Noted. Text revised and restructured, please vide pp29 line 21 - pp 29 line 25, pp 15 line 19 - pp25 line 16 in the FD.
20933	29	27	30	5	This section is very helpful, and makes the case for early action very strongly. It could also incorporate other messages from throughout the SPM that advocate for early action, for example B1.4, and the following text from chapter 2, p2-7, lines 43-45 : 'Land sector carbon dioxide removal, while not a substitute for strong action in the energy sector, has the technical potential to balance unavoidable emissions, with early action avoiding deeper and more rapid action later'. [, United Kingdom (of Great Britain and Northern Ireland)]	Noted, thanks. Statement has been revised and strengthened with additional material from the underlying chapters.
30845	29		30		Section D. It is important that this section sets out what are the top priorities for immediate action e.g. afforestation. The lack of this really undermines what should be a critical section. [Mike Morecroft, United Kingdom (of Great Britain and Northern Ireland)]	Noted and addressed in the FD. Please vide pp 29 line 1 - pp 31 line 5.
6347	29	1			Section D discusses opportunities for immediate action, but it is currently very general and would benefit from the inclusion of specific examples of win-win options that would have benefits across the board, e.g. reduction of deforestation and increased reforestation. This is particularly relevant for tropical developing countries for which reforestation / afforestation / halting deforestation have been identified as potential win-win options for both global and local mitigation of warming (e.g. as described in cross chapter box 1). [, Gambia]	Noted. Text revised and restructured in the FD, vide pp29 line 1 - pp 31 line 5.

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15935	29	3			I think it is needed to recall that the best, faster and most effective action is not to emit GHG!! [Caroline Vincke, Belgium]	Noted. Revised and restructured FD has mentions on reducing GHG emissions, please vide Sec B and C in FD.
33003	29	6			Site-specific nature-based and technological solutions, based both on new scientific innovations... [Christopher Pereira, Canada]	Noted. No action needed.
15937	29	8			please be more specific [Caroline Vincke, Belgium]	Noted. Please find revised and restructured text in the FD-Sec D (pp29 line1 - pp31 line 5).
15939	29	13			give example of no regret options, please be more specific in these sections! [Caroline Vincke, Belgium]	Noted. Please vide Sec D and C in the FD for revised and restructured text.
32969	29	13			Somewhere in the underlying report "no regrets" should be defined. [Doreen Stabinsky, United States of America]	Noted. In the revised and restructured FD, 'no regrets' deleted.
2115	29	15			Robust Evidence/high agreement [Tomas Molina, Spain]	Noted. Addressed. Text revised and restructured, vide pp 29 line 1 - pp 31 line 5.
15941	29	17			please add that this includes that POLITICS recognize that. Who are the actors who are recognizing? This is very conceptual and not so "actions". [Caroline Vincke, Belgium]	Noted. Please find pp 29 line1 - pp 31 line 5 in the FD for the revised and restructured text.
32971	29	21			"Slash and burn" is rather pejorative. This statement indicates an unfamiliarity with various practices of swidden agriculture that make sense in particular agroecological contexts. Delete. Don't advocate for the elimination of "low-productivity" practices without a greater understanding of lives and livelihoods dependent on those practices, the landscapes and agroecosystems where those practices are practiced, and the implications of elimination for communities and ecosystems. [Doreen Stabinsky, United States of America]	Noted. For revised and restructured text please vide pp29 line38 - pp30 line9 in the FD.
15943	29	24		26	I do not understand this. [Caroline Vincke, Belgium]	Addressed. Please vide pp 29 line 38 - pp 31 line 5 in the FD.
27705	29	30			What does "as well as in land use" mean? Is this statement referring to SLM? Please be more specific. [, Germany]	Noted. Statement now completely revised and restructured.
15947	29	41		43	Yes, the "multiple time frame" is important to mention. [Caroline Vincke, Belgium]	Noted.
33007	29	41			Investments in land and ecosystem restoration... [Christopher Pereira, Canada]	Noted. Section restructured and content changed.
32973	29	42			Why "but"? There is likely a more appropriate conjunction that could connect these two clauses. [Doreen Stabinsky, United States of America]	Noted. Section restructured and content changed.
7667	30	5	29	5	The word consultation is used whereas "engagement" is the approach most literature cited in this report highlights, There is a big difference. Consultation implies asking communities and stakeholders to comment on proposals wherea engagement embodies participation and inclusiveness before proposals are developed and during the adaptive process. This should be changed. [Judy Lawrence, New Zealand]	Thank you. This comment has been taken into account in the revisions process.
4985	30	1	30	1	It would seem that the general public and policy makers are also able to decide whether uncertainty presents barriers to immediate action. The sentence could start with "Care needs to be taken to ensure ..." [, Japan]	Noted. Statement now revised and restructured.
23147	30	1	30	3	"Uncertainty need not present a barrier to immediate decision-making..." This reads unclear, if not even incorrect, and leaves multiple interpretations. Depending on the meaning it could be "Uncertainty does not present...", "Uncertainty does not need to present...", "Uncertainty does not necessarily present...", "Uncertainty should not present..." [Anastasios Kentarchos, Belgium]	Noted. Statement now revised and restructured.
3997	30	1	30	3	Maybe the sentence could be rewrite along: "Decisions for immediate action should take into account uncertainty and ensure that long life-time actions are robust against it. Furthermore, such decisions should aim at preventing unintended consequences and maladaptation." [, Switzerland]	Noted. Statement now revised and restructured to be more clear.
23143	30	1	30	5	Paragraph D 2.4. should be reformulated as the main idea is hidden. [Anastasios Kentarchos, Belgium]	Accepted. Statement now revised and restructured to be more clear.

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23145	30	1	30	5	Consider rephrasing the statement, especially the beginning. The intended sense appears to be that it is better to act now in the face of uncertainty (provided decisions are taken carefully) than to use uncertainty as a pretext for delaying action. This does not quite come across in the statement as written. [Anastasios Kentarchos, Belgium]	Accepted. Statement now revised and restructured to be more clear.
29961	30	1	30	5	What are the existing decision support tools? Are they readily available? And how good they are? [, Estonia]	Thank you. This comment has been taken into account in the revisions process.
38465	30	1	30	5	It seems surprising that a determination was made that there is only "medium evidence" for the statement that there are decision-support tools to help make decisions in the face of uncertainty. That seems like a low characterization. [, United States of America]	Thank you. This comment has been taken into account in the revisions process.
6677	30	3	30	3	"...not lead to future unintended consequences or maladaptation". The policy maker as target audience might need a brief explanation or example of what constituted "maladaptation" [Mochamad Indrawan, Indonesia]	Noted. Statement now revised and restructured to remove the term 'maladaptation' to be more clear.
28309	30	6	30	6	While this statement is true, it is not followed by truly actionable messages. Or put another way, there is not enough specificity in those messages for policy makers at the global level to provide guidance on the "how" of any of them which would be necessary for national policy decisions and the mobilization of resources. The authors need to ask the question "what would a policy maker do in order to take action on these messages?" As currently written, they are so general as to sound like platitudes. [Barron Joseph Orr, Germany]	Accepted. Paragraph revised.
1629	30	6	30	8	Immediate investment – [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Paragraph revised.
1631	30	6	30	8	Investment in R&D, education, capacity-building & knowledge transfer to fill knowledge gaps & remove barriers could be encouraged by the UK government to better action interventions on how to motivate UK managers and employees to go green in UK-based work organisations. [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	Noted.
4987	30	6	30	8	We would suggest clarifying why the word "Immediate" is included in this context. If the word "immediate" is to be remained here, we would suggest adding the explanation on how and to what extent "immediate investment" "can fill knowledge gaps and remove barriers to action for many response options". [, Japan]	Accepted. Paragraph revised.
13329	30	6	30	8	D3. Immediate investment in research and development (R&D), education, capacity building, all kind of knowledge, including indigenous knowledge, and technology transfer can fill knowledge gaps and remove barriers to action for many response options (high confidence). {5.5, 6.5, 7.6} [Marina Rosales Benites de Franco, Peru]	Noted. SPM has been revised and shortened.
6351	30	6	30	39	This is a very useful section, but it would be made more useful by more specific information about where the greatest needs for capacity building and tech transfer are. For example, monitoring, reporting and verifying emissions and removals is a significant challenge for many least developed countries, as is monitoring impacts from climate change, desertification and land degradation. This is particularly important in the context of the Paris Agreement's enhanced transparency framework and Global Stocktake. [, Gambia]	Noted. Identifying specific locations and countries beyond the scope of the report.

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27707	30	6	30	39	We would caution the IPCC to promote (investments in) research, in particular in the SPM, in order to avoid potential allegations of conflict of interest. It would be more appropriate if the authors could find less policy prescriptive formulation by indicating key knowledge gaps and their consequences instead of suggesting ways to fill these gaps. Please see also our general comments on referring to knowledge gaps in the SRCCL. [, Germany]	Accepted. Paragraph revised.
38467	30	6	30	39	D3 should be revised to provide a more expansive discussion of gaps; the underlying sections should be more tightly focused on this theme. [, United States of America]	Accepted. Paragraph revised and tightened.
8773	30	6	30	39	I don't understand how D3 can be put forward as one of the top priorities - it sounds very self-serving for a group of scientists to recommend investment in science as a priority. If we want immediate impacts on climate change I would include a higher priority: address policy dissonance and ensure that agricultural policies are fully supportive of private investment in sustainable land management. Currently some countries have policies that forbid or prevent companies from investing in sustainable land management practices - this is a major barrier that is missing from the report. [Jean-Luc Chotte, France]	Noted. Peer review literature on countries and policies prevent sustainable land management required in chapters for elevation to spm.
12991	30	9	30	11	Knowledge gaps for recently emerging options- I would include biochar under this heading given the mixed results for enhancing crop growth and the potential emissions created in forming biochar. [Aidan Farrell, Trinidad and Tobago]	Noted. Paragraph rewritten but reduced. Only examples not exhaustive list provided.
32975	30	9	30	11	Replace "recently emerging" with "hypothetical". They are not "emerging". [Doreen Stabinsky, United States of America]	Rejected. Listed items are emerging.
6445	30	9	30	11	Knowledge gaps exist for almost all the response options which are non-productive. These gaps represent significant barriers for implementation. The gaps are both scientific, e.g. with respect to the effects and side effects of measures, but also with respect to cost-efficiency. [, Denmark]	Noted. Knowledge gaps have been included in the chapter analysis. In the SPM the confidence language address the confidence of scientific knowledge of mitigation and adaptation responses.
24649	30	9	30	11	The R&D examples are limited. Issues such as management systems for carbon in soil-biomass, and cross-overs between mitigation and adaptation, as well as the need to improve various systems and process models would also warrant inclusion here [, Ireland]	Noted. Paragraph rewritten but reduced. Only examples not exhaustive list provided.
33961	30	9	30	11	As currently formulated it could be perceived that the scientific community are not aware of the many problematic issues connected to a very large implementation of BECCS and how associated land use changes/conflicts with other land needs would be affected. Please consider to replace "broader impacts" with "sustainability if implemented at large scales". [, Norway]	Noted. Paragraph rewritten and reduced.
7669	30	9	30	11	This paragraph is somewhat weak especially the two examples. There is a huge gap in research on different types of response options for adaptation for example. This report appears to have highlighted ones we have been using or know about. There are transformational options that require much more research and linking options in mitigation and adaptation better to avoid maladaptive mitigation and adaptation options. Suggest this para is rewritten to identify these gaps. [Judy Lawrence, New Zealand]	Noted. Paragraph has been rewritten and reduced. Focus is on specifics to the report.
6679	30	9	30	11	"D 3.1. There are knowledge gaps for some response options, particularly among the more recently emerging options (e.g., enhanced weathering of minerals, BECCS), in terms of both their efficacy and their broader impacts (robust evidence, high agreement). {5.6.1, 6.5}". Is this detail really pertinent to the policy maker? Otherwise please consider perhaps dropping the statement [Mochamad Indrawan, Indonesia]	Copy edit to be completed prior to publication.

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22169	30	9	30	20	D3.1, D3.2, D3.3-Please check: Kindly provide confidence statement. [Suvadip Neogi, India]	Accepted. Confidence statements provided in redrafted sections.
8617	30	10	30	10	This is also true for some crop or cattle management options. [Marc Aubinet, Belgium]	Noted. Space limitations prevent further examples.
32589	30	12	30	14	Use of terms such as "Agricultural technology and reciprocal knowledge transfer" and 'Indigenous and local knowledge' should first define these terms, clarify overlaps/commonalities and enunciate differences, and clarify their place in context to agroecology practiced by small and peasant farmers contributing significantly to global food and nutrition security. Food First FAO, https://foodfirst.org/agroecology-for-food-security-and-nutrition-fao-document/ [Neeraja Havaligi, United States of America]	Noted. SPM paragraphs rewritten and reduced.
30711	30	12	30	17	This section need more clarity. In general Agricultural Technology and Knowledge transfer under a changing climate will help to sustain and enhance food production and productivity. This is what we would like to see being reflected. [, United Republic of Tanzania]	Noted. SPM paragraphs rewritten and reduced.
23149	30	12	30	18	The knowledge gaps in this statement merely repeat observations made earlier in the SPM. The statement should refer to these and, where possible provide more specific advice on knowledge gaps (D3.1 follows this approach to some extent). [Anastasios Kentarchos, Belgium]	Accepted. SPM rewritten and tightened.
16493	30	12	30	18	Why suddenly urban agriculture? [, Republic of Korea]	Accepted. Paragraph revised.
22167	30	12	30	18	D3.2-Please check: Science campaign as outreach activity for knowledge dissemination and awareness generation among the stakeholders is necessary also. [Suvadip Neogi, India]	Accepted. Paragraph revised.
7291	30	12	30	20	An assessment of this bullet point is required. [Debra Roberts, South Africa]	Accepted. Confidence statements provided in redrafted sections.
837	30	12	30	20	these paragraphs don't include any confidence levels. Either they are updated or the paragraphs should be deleted. [, Spain]	Accepted. Confidence statements provided in redrafted sections.
27809	30	14	30	14	It would be better to insert 'In many cases' in front of sentence [Raehyun Kim, Republic of Korea]	Copy edit to be completed prior to publication.
12625	30	15	30	16	Strong challenge to the sentence: 'Knowledge is needed on both supply-side and demand-side mitigation, including how to change consumption behaviour'. There is in fact much evidence around sustainable consumption, including studies on reduction in meat consumption. Suggest replacing with: 'While further research is needed on both supply and demand side mitigation, extensive literature on sustainable production and consumption already exists. Studies suggest that changing consumption patterns on the scale and at the pace required for climate change adaptation, mitigation and the deployment of CDR techniques will require government interventions in countries with high- carbon, unhealthy diets' (Chatham House, 2015) (Chatham House (2015) Changing Climate, changing diets: Pathways to Lower Meat Consumption) [Carina Millstone, United Kingdom (of Great Britain and Northern Ireland)]	Noted. Peer reviewed literature referred to chapter.
33963	30	16	30	18	Please justify why minimise of food loss and waste is highlighted here. [, Norway]	Noted. SPM revised, reduced and redrafted.
13477	30	16	30	18	It is important to also point out that food loss is not just those that are losses from the table, but also from post-harvest activities, which is what happens mostly in developing countries which lack resources to avoid these losses. [Lourdes Tibig, Philippines]	Noted. SPM paragraphs rewritten and reduced.
8619	30	16	30	18	and also to develop local agriculture and short food chains [Marc Aubinet, Belgium]	Noted. Paragraph rewritten but reduced. Only examples not exhaustive list provided.
24689	30	19	30	20	Reference to capacity building in systems and structures for monitoring and reporting, including from global to local, should be provided [, Ireland]	Noted. SPM paragraphs rewritten and reduced.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
20941	30	19	30	20	Do you mean the other way around? Please could you clarify what this means. [, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. SPM revised paragraph rewritten.
6143	30	19	30	20	Instead of writing "Long-term capacity-building efforts for both resource management and governance mechanisms strengthens technology transfer for mitigation and adaptation in land sectors. {7.4, 7.5.4}", please write "Long-term embedded capacity-building efforts for both resource management and governance mechanisms strengthens knowledge and technology transfer for mitigation and adaptation in land sectors. {7.4, 7.5.4}" [Jacques-Andre Ndione, Senegal]	Copy edit to be completed prior to publication.
1633	30	19	30	39	Long-term capacity building efforts – [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	Noted.
1635	30	19	30	39	I am part of research team that has just won £410,000 from the German & Austrian research councils to investigate voluntary workplace green behaviours (VWGBs) at workplaces across Europe, the UK & USA. As such, I can help with our UK capacity building effort in developing environmentally sustainable (ES) knowledge, if required. Indeed, with my planned work with others tackling migration from Bangladesh to the UK, we seek to lead on governance mechanisms, investment of people, monitoring/measuring progress & improving human & institutional capacities – to work to reduce the numbers of climate change (flood) refugees migrating from Bangladesh to the UK. In doing so, we look to provide role-model case study research, policy recommendations & interventions for other countries to use & learn from globally too. [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	Noted.
1637	30	19	30	39	Lastly here, I lead & conduct research in the new field – of green HRM – and can provide further expertise to develop long-term capacity-building efforts with UK-based work organisations & their staff to 'go green', plus relevant green HRM tools for the UK government to use too, if desired. If so, please email me at: douglas.renwick@ntu.ac.uk if you are interested to know more on how I can help you here. [Douglas Renwick, United Kingdom (of Great Britain and Northern Ireland)]	Noted.
17169	30	20	30	20	"Long-term capacity-building efforts for both resource management and governance mechanisms strengthens ..." : strengthens -> strengthen (efforts is a plural form). [Renaud Toussaint, France]	Copy edit to be completed prior to publication.
38471	30	21	30	27	Cross-references point the reader to Chapters 3 and 7. However, sustainable land and forest management indicators are also described in Chapter 4 (i.e., 4.3.2), action indicators are also described in Chapter 6 (i.e., 6.2.2.2), and indicators in general are mentioned throughout the document. [, United States of America]	Noted. SPM paragraphs rewritten and reduced.
8825	30	21	30	27	The development of environmental indicators are important, I suggest to include drought indicators [Jean-Luc Chotte, France]	Noted. SPM paragraphs rewritten and reduced.
26019	30	22	30	25	Proposition de reformulation: "Soil quality" should be added to this list, instead of "soil". "Water quality" is repeated twice. [, France]	Noted. SPM paragraphs rewritten and reduced.
4989	30	23	30	24	The phrase "water quality" is mentioned twice. Suggest deleting one of them for avoid duplication. [, Japan]	Copy edit to be completed prior to publication.
3999	30	24	30	24	Write: "... water quality, etc.) as well as biodiversity and ecosystems conservation.". [, Switzerland]	Noted. SPM paragraphs rewritten and reduced.
6145	30	24	30	24	Instead of writing "water quality etc.)", please write "water quality, etc.)" [Jacques-Andre Ndione, Senegal]	Noted. SPM paragraphs rewritten and reduced.
31605	30	25	30	26	which people? [, Brazil]	Rejected. Which people is context specific.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
5331	30	25	30	26	The involvement of people is supported. However, it might be helpful to be more specific which people should be involved in the selection of indicators: land owners, scientists, relevant representatives of the local/regional/national governance levels. [Klaus Radunsky, Austria]	Rejected. Which people is context specific.
26093	30	25	30	26	The word "indigenous" may have been omitted before "people" in the first instance, and in the second instance "people" may be replaced with "them" [Reid Detchon, United States of America]	Copy edit to be completed prior to publication.
28311	30	28	30	30	This is a good example of the previous comment. The only thing that a policy maker could recommend based on this statement would be to invest in monitoring -- which they have already been told. However, it could become actionable with an additional sentence like "The benefits of SLM and monitoring multiple SDGs in an integrated way can be met through the pursuit of land degradation neutrality, which provides a framework for countries to optimize the spatial mix of interventions necessary to ensure no net loss into the future while navigating the tradeoffs which come from multiple and often competing demands for land." [Barron Joseph Orr, Germany]	Noted. SPM paragraphs rewritten and reduced.
7293	30	28	30	30	An assessment of this bullet point is required. [Debra Roberts, South Africa]	Accepted. Confidence statements provided in redrafted sections.
14607	30	28	30	30	The term 'SDGs' is not defined. Moreover they are only discussed in these two sentences of the SPM. Given their high profile in the SPM of the SR 1.5 and their relevance to land use, I might have expected them to have a higher profile in this SPM. [, Canada]	Noted. SDGs and acronyms to be copyedited in final report.
38473	30	28	30	30	The indicator discussion would be bolstered by a description of the type of measures considered with respect to ecosystem services (or other tools), rate of change in these metrics, and any standards for each category of interest. For example, which metric or set of metrics are standard for forest management vs. agricultural lands vs. etc., and would these metrics differ for different forest or agricultural land types, or scales of interest that would best define 'collective action' needs? Further, could the indicator sections be more prescriptive in terms of how to address knowledge gaps? [, United States of America]	Noted. SPM paragraphs rewritten and reduced.
11659	30	28	30	30	IPCC certainty language is missing [Linah Ababneh, Sweden]	Accepted. Confidence statements provided in redrafted sections.
22171	30	28	30	30	D3.5-Kindly provide confidence statement. [Suvadip Neogi, India]	Accepted. Confidence statements provided in redrafted sections.
6149	30	29	30	30	Authors wrote "Considering the multiple SDGs allows for holistic consideration of interconnected water, energy, food issues. {7.6.6}" Instead of talking about " interconnected water, energy, food issues ", why not talking about "nexus approach (energy, water and food issues)" [Jacques-Andre Ndione, Senegal]	Noted. SPM paragraphs rewritten and reduced.
15535	30	30	30	30	Replace last comma with and, so that it reads: "water, energy and food issues." [Annika Herbert, South Africa]	Copy edit to be completed prior to publication.
6147	30	30	30	30	Instead of writing "energy, food issues.", please write "energy and food issues." [Jacques-Andre Ndione, Senegal]	Noted. SPM has been significantly revised and this paragraph rewritten.
4001	30	31	30	31	Write: "... capacities and open access to relevant data and information, early warning ...". [, Switzerland]	Noted. SPM paragraphs rewritten and reduced.
13479	30	31	30	34	Only for desertification? How about land degradation? [Lourdes Tibig, Philippines]	Noted. SPM has been significantly revised and this paragraph rewritten.
29963	30	31	30	36	Sure it is also applicable to other land use changes caused by climate change (than just desertification). [, Estonia]	Noted. Paragraph rewritten and reduced.
16495	30	31	30	39	Citizen Science comes suddenly. The necessity of citizen participation should be addressed in the context. [, Republic of Korea]	Accepted. Paragraph revised. Citizen science omitted.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
839	30	31	30	39	delete. These paragraph is qualified as of "low evidence". We would prefer not seeing anything with low evidence in the SPMs. [, Spain]	Noted. Consideration given to low evidence statements and applicability to spm.
27709	30	35	30	35	"monitoring and early warning systems help combat desertification and extreme events": is "combat" the right term? How to "combat extreme events"? Better: "monitoring and early warning systems provide crucial information [for the public and private sector] to combat desertification and to improve preventive action against extreme events. [, Germany]	Noted. SPM paragraph rewritten.
29651	30	6			This final section is really important and useful for policy makers. Some additional material from the executive summary of chapter 7 could be raised to the SPM here, e.g. lines 36 to 45 of page 6 of chapter 7 (referring to the importance of measuring performance). In particular, specific reference to targets under the Paris Agreement is important here. [, Saint Lucia]	Noted. Paragraph substantially revised and reduced.
15945	30	7			gender equity? [Caroline Vincke, Belgium]	Noted. Gender added in another paragraph.
27723	30	10			biochar should be added to this point. [Helene Muri, Norway]	Copy edit to be completed prior to publication.
2117	30	11			Robust Evidence/high agreement [Tomas Molina, Spain]	Copy edit to be completed prior to publication.
15949	30	19			very important [Caroline Vincke, Belgium]	Noted. SPM paragraphs rewritten and reduced.
38469	30	20			Change "strengthens" to "strengthen" (or remove the word "efforts" from line 19). [, United States of America]	Copy edit to be completed prior to publication.
15951	30	23		24	natural ecosystem fitness and stability• Surlignement, page 3032 [Caroline Vincke, Belgium]	Noted.
28607	30	28		30	It would be good to indicate more in details the specific SDGs linked to sustainable land management with their specific indicators for monitoring and how they can be measured/monitored. [Inge Jonckheere, Italy]	Noted. Paragraph rewritten and reduced.
23151	30	33			Add: degradation and other ecosystems to "addressing desertification under ..." as the issues mentioned before are needed elsewhere also. [Anastasios Kentarchos, Belgium]	Noted. Paragraph rewritten and reduced.
108					Good at suggesting 'remote sensing' at earth observation of change. This is what motivates action when people see change over time!. [Brian Huberty, United States of America]	Noted
12615					I would recommend leading with demand-side measures over supply-side measures, as Chapter 5 repeatedly makes the point that changes in diets and prevention of food waste could shrink the carbon and land use footprint of agriculture without changes in current agricultural practices. This crucial point needs to come out very strongly in Chapter 5 and in the SPM. [Carina Millstone, United Kingdom (of Great Britain and Northern Ireland)]	noted - the SPM has been redrafted to give appropriate weight to a range of issues
7341					Because of gaps in the underlying chapters, the SPM is virtually silent in terms of the actual costs of impacts and responses (other than Table SPM1 which gives indicative guidance) and in terms of identifying the range of available financial mechanisms and incentives required to drive the rapid action required. [Debra Roberts, South Africa]	noted - the SPM has been redrafted to give appropriate weight to a range of issues
7343					Gender and land tenure emerge as very powerful factors re: SLM in the underlying chapters but these two issues are not prioritised in the SPM. Both of these issues should have stand alone bullet points in the SPM in section C. [Debra Roberts, South Africa]	noted - the SPM has been redrafted to give appropriate weight to a range of issues

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
7345					The urban issue is an important one to profile in the SPM. SR1.5 points out that the global urban system is one of the 4 systems where a major transition is required if ambitious climate action is to be achieved. The underlying SRCCL chapters call out the importance of urban areas as drivers of land use change both directly and indirectly e.g. with far reaching impacts on biodiversity and food security, but also as a locus for innovative action through e.g. land use planning, densification, local food production etc. It is important that the SRs keep deepening key policy relevant messages such as these so that a coherent storyline builds across the full assessment cycle. This is also in line with the Panel's decision to strengthen the focus on cities in this assessment cycle. [Debra Roberts, South Africa]	noted - the SPM has been redrafted to give appropriate weight to a range of issues
32877					The clearest articulation of limitations of IAMs and scenario outputs is found in a paragraph in the executive summary of chapter 7. This paragraph (p. 7-4, lines 33-47) should be considered for inclusion directly in the SPM. [Doreen Stabinsky, United States of America]	The SPM section on IAMs has been rewritten
24367					The Government of Belgium would like to express its appreciation for the very large amount of work that went into the preparation of this report. We find however that the SPM is too long. As we suggested before, 10 pages would be fine ! [, Belgium]	the number of words is less than 10 IPCC pages
24369					There are many (and complex, big and long) figures in the SPM. We suggest to reduce the number and overall simplify. [, Belgium]	all figures have been deleted and updated
24449					There is a lack of consistency with respect to the indication of the level of confidence and evidence. It needs to be more consistently reported in the next version of the SPM. The relation of the "confidence" scale to agreement and evidence should be explained (Figure 1 of the IPCC uncertainty guidance note from Jasper Ridge?). In addition, there are some paragraphs without any evaluation of confidence or agreement. [, Belgium]	use of confidence language has been revised
24451					Would it be useful to clarify that the SPM only looks at the potential co-benefits of CC actions for biodiversity and the negative impact of CC on biodiversity, but doesn't mention the potential of biodiversity in the fight against CC (so the other way around). Biodiversity conservation/restoration and CC mitigation/adaptation measures can be mutually supportive if addressed correctly. In other words, biodiversity can be part of the solution, not merely an additional positive outcome of CC mit/adapt. [, Belgium]	noted - the SPM has been redrafted to give appropriate weight to a range of issues
6447					The SPM encourages policy makers to implement a wide array of mitigation response measures, but it does not adequately address many of the barriers that policymakers face in trying to implement such. These barriers are related to, but not limited to: - Policy/regulation fragmentation between climate, animal welfare, environment, nature and biodiversity - Incentives for farmers to implement mitigation options - Incentives for states to implement mitigation options (including carbon leakage problems) - UNFCCC emissions accounting and monitoring rules, with respect to agricultural emissions and LULUCF It would strengthen the message and applicability of the SPM if the specific challenges that policymakers face where more thoroughly addressed [, Denmark]	noted - the SPM has been redrafted to give appropriate weight to a range of issues

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
6449					A significant barrier for mitigation and adaptation in agriculture, which is not adequately covered in the SPM, is lack of awareness among farmers. Many farmers even in highly developed countries are unfamiliar with climate-friendly agricultural management. Information dissemination and advisory services can be an effective tool for enabling farmers to implement climate friendly measures, both voluntarily and in regards to regulatory demands. [, Denmark]	noted - the SPM has been redrafted to give appropriate weight to a range of issues
29867					Throughout SPM it should be made very clear which impacts and to what extent they are attributable to climate change. The links between mitigation and adaptation (incl. adaptation benefits of mitigation) need greater attention in the SPM and these should be presented clearly (e.g. as comparison) in order to avoid false impressions of the impacts of certain adaptation measures or climate change impacts. More attention should be given to the current state of knowledge on tipping points, and the importance of forests/forest management in mitigation and adaptation while considering the impacts of the changing climate on forests. The latter also applies to peat- and wetlands. The SPM needs to be factual and cite evidence and reserach results (in ranges) where possible and avoid very general statements that are of little use for policymakers. [, Estonia]	noted - many of these issues are addressed in the revised version.
29869					The figures and text should support each other in SPM (some figures have not been referenced or have incorrect figure numbers) and most of the issues presented in figures should be also discussed in the text. [, Estonia]	all figures have been deleted and updated
15769					As the report was prepared for decision and policy makers, prioritizing the mentioned issues under three sections (A,B and C) for making the best decision is valuable. [, Iran]	noted
26207					We would like to thank the authors for providing us with this draft of the "Special Report on Climate Change and Land (SRCCL)". In general, we appreciate the draft and would like to congratulate the co-chairs for the efforts to fully integrate the three working groups into this report and provide us with a report that forms a good basis to work on. We especially welcome that the key messages are in general clear and that the graphics of the SPM are readable. All important topics in relation to the subject are fully covered. The fact that the bold statements in each section can be grouped to form the key messages of the report is also an important aspect of the current draft. [, Luxembourg]	noted
26209					Some expressions are not used in a coherent way through the SPM. One such example is "degree of warming", which is sometimes written in full letters, sometimes abbreviated as "°C". Another one is the usage of surfaces, either indicated as ha or km2 consistently throughout the SPM. Please streamline the used language in this respect [, Luxembourg]	accepted - addressed in latest version
3333					It is very important to include and emphasize in SPM the idea stated in chapter 1 about the needs of more accurate data on the loss-source, and specially the deployment of economic instruments that can internalise the cost of food waste reduction into the product price. [, Mexico]	noted - the SPM has been redrafted to give appropriate weight to a range of issues
16497					It is not clear what messages do authors want deliver to policy makers through this SPM. [, Republic of Korea]	noted
16499					The concept of food security should be need to be more clear. We think many countryies make it considerd more saftey and efficiency than nutrition. But in this SPM, it was used with very blur. [, Republic of Korea]	noted - the SPM has been redrafted to give appropriate weight to a range of issues
16501					The focus of SRCCL is LAND and we maybe want to development and/or change on LAND POLICY through this report. C & D part has more clear suggestions and contents related on LAND POLICY therefore it need to restrcturing in order to C, D, A and B. [, Republic of Korea]	noted - the SPM has been restructured but the order of the sections remains the same

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
16503					It is very important for policy makers to understand through figures and tables. However, most of the figures and tables included in the SPM are difficult to understand intuitively cause lack explanation of figures, and lack of connectivity with figures and contents. [, Republic of Korea]	all figures have been deleted and updated
16505					With regard to C part, there is no mention of 'how long will it take to return to the previous land condition if we do not take immediate action' and 'is the land can return to the previous condition?'. This is very important for policy makers because it is closely related to the cost and time of returning to the previous land status. [, Republic of Korea]	noted - information on this topic is limited in the underlying chapters.
38165					The concept of improving soil health as an agricultural practice capable of mitigating climate change impacts is not included. [, United States of America]	noted - the SPM has been redrafted to try to give appropriate weight to a range of issues
38167					Instead of saying "Global South," why not just say "Southern Hemisphere?" This document is jargony and needs to be edited for policymakers. [, United States of America]	accepted - references to global south removed
38169					"Value-chain management" is another example of jargon that should be modified. [, United States of America]	noted - additional explanatory text provided
38171					The title "permanence/saturation" is not defined. Jargon. [, United States of America]	accepted
38173					Much of the land degradation and land management content of the SPM is not specific to climate change-related land degradation. Given that the SPM is longer than mandated in the outline and the approved outline was for a report on climate and land, suggest removing content regarding land degradation in general unless essential for understanding the concepts contained in the report. Primary focus should be given to the climatic factors with a clear acknowledgement of the relative importance of other factors, where relevant. [, United States of America]	noted - word length was correct. Additional figures were provided for comment. This has now been revised
38175					Since many of the policy or general audience readers will only read the summary, explain the different categories of confidence, evidence, and agreement -- as is usually done in an SPM footnote. [, United States of America]	accepted - this has been spelt out at the start of the SPM
38177					The SPM should include a more developed discussion of gaps in knowledge, data, and scientific understanding. D3 is a start, but should be expanded. [, United States of America]	noted - the SPM has been redrafted to try to give appropriate weight to a range of issues
38179					When discussing land area, some parts of the SPM use Mha while others use Mkm2. Consider choosing one unit (preferably Mkm2 given the scales involved) for consistency. [, United States of America]	Mkm2 adopted for consistency
38181					The FOD SPM is longer than requested and would benefit from streamlining. In particular, several figures and tables relate information that is more detailed than typically included in an SPM (e.g., SPM Box 1, Table 1, Figures 5 and 7). Suggest that removing these could result in a more focused and meaningful SPM. [, United States of America]	all figures have been deleted and updated
38183					Numerous statements in the SPM lack confidence statements, particularly in Section D. All statements should be assigned a confidence level. [, United States of America]	use of confidence language has been revised

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
38185					To help policymakers understand the basis for the projected impacts under specific emission and development scenarios, suggest explaining the range of GHG emissions and socioeconomic conditions consistent with the RCP and SSP scenarios used in the report. Some relevant content may be drawn from AR5 WGI Chapter 12. This information should be presented concisely within a box early in the SPM. This box should explain to readers with which pathway or pathways current emissions are consistent, and help readers understand the global context that would likely accompany a particular projected scenario. [United States of America]	partly accepted, section A now included a headline statement that elaborates on scenarios
38187					In several instances this document associates the words "requires" and "requirement" with the Paris Agreement goals. The Paris Agreement does not have requirements associated with its goals or aims as the case may be. Suggest direct quotes of the Paris Agreement over potentially misleading paraphrasing. [United States of America]	noted. This language has been revised
21783					The entire SPM should be reviewed to check for possible duplication. May issues appear to occur in different places, but with similar content. Summarising and consolidating similar issues that have occurred over multiple chapters would help reduce length. [Graham von Maltitz, South Africa]	noted
21785					Inconsistency in use of confidence levels. Some statements have, so do not have. [Graham von Maltitz, South Africa]	use of confidence language has been revised
283					The report mentions migrants from climate change induced water scarcity, droughts, floods, ice melt, etc- but it does not stress on the exacerbated effect climate change will have on different types of migrant flows - internal migrants, seasonal migrants, cross country migrants (seeking refuge from unstable politics, violence, turmoil) [Mahak Agrawal, India]	noted - the SPM has been redrafted to give appropriate weight to a range of issues
287					The report is largely based on modelling of imageries and building pythons, indices for multivariate analysis and deriving key findings. But, it does not indicate that there still exists uncertainties of change - we can predict climate change, land use-land cover change with high level of confidence, but we cannot ascertain behavioural change and technological change - critical parameters that can significantly affect the modelling [Mahak Agrawal, India]	use of confidence language has been revised
23285					There remains inconsistent use of IPCC uncertainty language in the SPM. [Mark Howden, Australia]	use of confidence language has been revised
23299					Should 'net land removal etc' read something like 'the net removal of CO2 from the atmosphere by land-based processes' [Mark Howden, Australia]	this text has been revised
23305					The authors have done a great job in progressing this draft. However, it remains much longer than the Outline-agreed lengths. [Mark Howden, Australia]	the number of words is less than 10 IPCC pages
2247					In the SPM land degradation (A4) comes before desertification (A5) but in the report it is the other way around. What is the rationale for desertification coming before land degradation in the report? Surely desertification is a more extreme form of land degradation and so should come after land degradation? [Nina Hunter, South Africa]	Noted. The chapter order follows the outline approved by governments

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
28727					D2.4: re uncertainty and future unintended consequences: BECCS, bioenergy and biochar are NOT robust against uncertainty. Precaution has been expressed but these approaches, due to large land requirements are indeed likely to lead to unintended consequences and maladaptation. The climate impacts of bioenergy have been much debated, and the literature indicates that few have net benefit when full accounting is done. Unintended consequences of false accounting will be huge if for example, forest biomass harvests for bioenergy continue to expand as, for example, anticipated by the International Energy Agency. [Rachel Smolker, United States of America]	noted - this is partly addressed in the new bullet on CDR section B5
28729					D3.1: BIOCHAR should be included along with BECCS and enhanced weathering. There are many conflicting results in the literature on both long term carbon sequestration and other impacts - on N2O and methane emissions and in all other applications. [Rachel Smolker, United States of America]	accepted - addressed in latest version
27811					It is not clear what messages do authors want deliver to policy makers through this SPM. [Raehyun Kim, Republic of Korea]	noted
27813					It is very important for policy makers to understand through pictures and tables. However, most of the pictures and tables included in the SPM are difficult to understand intuitively cause lack explanation of pictures, and lack of connectivity with pictures and contents. [Raehyun Kim, Republic of Korea]	all figures have been deleted and updated
27815					With regard to C part, there is no mention of 'how long will it take to return to the previous land condition if we do not take immediate action' and 'is the land can return to the previous condition?'. This is very important for policy makers because it is closely related to the cost and time of returning to the previous land status. [Raehyun Kim, Republic of Korea]	noted
33425					While the SPM reads very well, it has little to say on a number of topics that feature in other chapters, especially on the thorny (but central) problem of the interlinkage between (i) shifting global diets (well covered in the SPM); (ii) greatly expanding global trade in foods;(not touched on at all in the SPM but raised in Chapters 1 and 5) (iii) the vulnerability of small farmers in climate-change affected countries to price spikes and shocks (again covered in chaptrs 1 and esp 5 but missing from SPM); and (iv) resulting poverty/equity concerns themselves exacerbating food insecurity (chapter 5). [Stephen Humphreys, United Kingdom (of Great Britain and Northern Ireland)]	noted - the SPM has been redrafted to try to give appropriate weight to a range of issues
17357					SPM generally lacks comparisons of different emissions pathways and their implications for land. Additionally there's overall lack of connectivity with biodiversity and ecosystem services in climate change impact and management measures. Both are significant for policymakers decision making in the context of land use. [Taehyun Park, Republic of Korea]	noted

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
17359					The SR15 made it very clear that if we are to avoid or minimize the need for large-scale BECCS and afforestation, then what happens between now and 2030 will be critical: significant near-term measures, with strong focus on lowering energy and land demand (illustrated by the pathway archetypes P1 and P2 in the SR15) could eliminate or limit the need for BECCS and reduce the need for other land-based CDR, with many sustainability co-benefits. Given that governments are currently reconsidering their NDCs for 2030 and beyond, it would be very important for the SRCCL and its SPM to have a strong and clear message on the critical role of near-term action (including in other sectors than land). The current draft SPM doesn't do the job, and actually even refers to "2030 to 2050" as "near term" (see B4.1.) which could be quite confusing. [Taehyun Park, Republic of Korea]	partly addressed by the inclusion of Headline statement B5 on CDR
21937					The SPM in its part B on adaptation and mitigation response options summarises in Table SPM 1 A on page 15 benefits, adverse impacts, saturation and permanence issues, costs and barriers of different land management response options. This is a crucial piece of policy advice, perhaps the most important one in the entire report. Unfortunately it contains an array of inaccurate or missing information. A few examples: - biodiversity as a very important aspect of benefits vs impacts is missing - crucial differences between reforestation (aiming at native forests) and afforestation (aiming at tree plantations) re adaptation, land degradation, saturation and permanence of the sequestered carbon are completely missing even though reforestation has significant benefits over afforestation in all of these aspects and also on biodiversity - the strong link between afforestation and bioenergy incl. BECCS with afforestation as main source of the significant additional biomass needed in many models does not become evident as they feature very differently on adaptation, land degradation, desertification and permanence when in fact they should be similar - reduced deforestation doesn't have any benefits listed beyond mitigation. These and other shortcomings must be addressed so that Table SPM 1 A can provide the key guidance and orientation for policymakers it should. In order to do so it is important to further clarify and define important terms such as afforestation, reforestation and forest management including how they relate to each other. These should be aligned with terms and definitions used by other important bodies in this field such as CBD or IPBES. [Taehyun Park, Republic of Korea]	noted - the SPM has been redrafted to give appropriate weight to a range of issues
21939					The SPM could reflect the findings present in Cross-Chapter Box 3 of Chapter 2 more strongly in the SPM. The SPM currently does not reflect much on fires as contributing to climate change via emissions of CO2 and many other driving agents. Chapter 2, pp 115 to 117 in particular is informative and clear on fires being a significant contributor of net GHG emissions including black carbon (called in the chapter carbonaceous aerosols). [Taehyun Park, Republic of Korea]	noted - the SPM has been redrafted to give appropriate weight to a range of issues
21941					Reduced deforestation also has significant adaptation benefits as well as land degradation and desertification benefits through improved evapotranspiration, which are not listed. [Taehyun Park, Republic of Korea]	noted
2057					Those bold "resumée" should be made more readable by putting the letters into a box and maybe make the text more plain with the same content. [Tomas Molina, Spain]	Noted
15237					in Section A, the linkage between climate change and land should be stressed. I think it is not very appropriate for IPCC report stating "climate change is an additional stress". [Zhai Panmao, China]	partly accepted - new structure of Section A addresses many of these points

IPCC SRCCL Second Order Draft Review Comments and Responses - SPM

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15239					Adaption to climate change should be an important part of SRCCL. However, in this SPM, content related to adaption is too weak. [Zhai Panmao, China]	Adaptation has been emphasised where supported by underlying chapters
15241					please double check the consistency between SPM, chapter ES, and the main report, especially for some quantitative numbers such as the number of people who lack adequate nutrition. [Zhai Panmao, China]	noted
15243					many bullets and sub-bullets lack in uncertainty language such as B4, C1.3, C4.2 etc. [Zhai Panmao, China]	use of confidence language has been revised
24727					The summary is too technical and does not resonate with the language and messages expected by policy makers. It should be more usefully framed to make it more policy relevant. For example, it is not clear in the summary which mitigation and adaptation options are being recommended and what benefits or impacts they would bring. The same applies to "D. Opportunities for immediate action" where the summary could better framed in relation to being specific about the actions that need to be taken, and the impacts/benefits of these actions for both mitigation and adaptation. Some specific and relevant examples of results or impacts would be very useful to policy makers to help them take decisions in implementing such actions. [Zitouni Ould-Dada, Italy]	noted - the SPM has been redrafted to give appropriate weight to a range of issues
24777					The same applies to "D. Opportunities for immediate action" where the summary could better framed in relation to being specific about the actions that need to be taken, and the impacts/benefits of these actions for both mitigation and adaptation. Some specific and relevant examples of results or impacts would be very useful to policy makers to help them take decisions in implementing such actions. [Zitouni Ould-Dada, Italy]	Partly addressed by restructure and revisions to section C & D
24779					Early action to address food security yields economic benefits. Benefits of actions should not focus only on "economic" benefits but should address benefits for the whole system including economic and social benefits. This should be accompanied with some examples of results from actions taken to provide policy makers with sufficient evidence to support and implement actions. [Zitouni Ould-Dada, Italy]	noted
24781					The term "gender" is only mentioned once in the entire summary. Yet, gender equality and empowering women is critical to "Enabling climate mitigation and adaptation responses" (i.e. section D). This is particularly important from a policy-making perspective to enable vulnerable communities including women and youth, particularly in rural areas, to have access to land, finance, technology and knowledge. [Zitouni Ould-Dada, Italy]	noted - the SPM has been redrafted to try to give appropriate weight to a range of issues
24783					It would be also helpful to include a timeframe for the response options and actions to help policy makers understand what actions to take and by when. [Zitouni Ould-Dada, Italy]	noted - use of specific and quantified statements has been improved where supported by underlying chapters