

IPCC SRCCL Second Order Draft Review Comments and Responses - Chapter 7

Comment No	From Page	From Line	To Page	To Line	Comment	Response
40825	0		0		Please see my general remarks on the report and those on the SPM. I appreciate the developments of chapter 7 from the FOD. Chapter7 is addressing all the elements identified during scoping. The narrative works well. [Valerie Masson-Delmotte, France]	Accepted. Thank you.
40827	0		0		Ch 7 could link with SROCC in framing deep uncertainty and robust decision making under uncertainty, and resilience. [Valerie Masson-Delmotte, France]	Accepted. Decision making under uncertainty is covered in 7.6.2. Deep uncertainty, although the term is not specifically used, is in the section with unknown unknowns etc. Decision making tools are here and resilience is covered in 7.7.1.
40829	0		0		would chapter 7 also consider in section 7.3 implications of continued land degradation (due to non climatic causes) for climate risks? [Valerie Masson-Delmotte, France]	Thank you. Section 7.3 addresses the risks of land degradation at current and possible future temperature levels in the discussion of the burning embers diagram (7.3.2).
40831	0		0		The assessment of chapter 7 on potential non linearities, tipping points, needs to be carefully building on SR15 (chapter 3, regional tipping point table 3.8) and ensuring coherency with SROCC. Please consider carefully what is robust, how to express deep uncertainty, what is physically plausible. [Valerie Masson-Delmotte, France]	Thank you for this suggestion, which has been taken into account in the revision.
40833	0		0		ES statements need to have confidence statements also for underlying sentences (not just key finding). This underlying text in this chapter are particularly long compared with other chapters, and harmonisation would be better for the compilation of ES to form a technical summary with a homogeneous style. [Valerie Masson-Delmotte, France]	Accepted and revised where appropriate.
40835	0		0		Some elements of risk assessment are also grounded in other chapters, but sections are not referered to in many places. Calls to sections in curly brackets are missing in ES. [Valerie Masson-Delmotte, France]	Curly bracket references added to ES.
40839	0		0		For risk assessment, how is adaptation taken into account? And limits to adaptation cpaacity and residual risk? Please be very explicit and transparent on this. [Valerie Masson-Delmotte, France]	Thank you for this suggestion. The literature assessed (particularly for the embers diagram in 7.3.2) made frequent note of adaptive capacity and this was taken into account in the assessment of risks to humans and ecosystems.
40849	0		0		how does ch 7 assess not only negative outcomes (risk) but also positive ones (opportunities) so as to provide a balanced assessment? [Valerie Masson-Delmotte, France]	Rejected. Chapter 7 is specifically tasked with risk and decision making. Opportunities are not part of risk or part of chapter 7.
40891	0		0		each section needs to express clearly conclusions (in summary, ...), progress of knowledge (since AR5...), with conclusions using the calibrated language to express confidence. This would then be used for the ES/SPM and provide clear traceability. Missing in several sections. [Valerie Masson-Delmotte, France]	Accepted. Where this statekement on progress of knowledge and where calibrated confidence can be used it has been added. Traceability to sections of chapter 7 added.
21599	0				there are many instances in this chapter where uncertainty terms are used without proper assessment (do a word search for "likely" and check whether there has been a quantitative, statistical or otherwise probabilistic assessment done). [Andy Reisinger, New Zealand]	Accepted and revised where appropriate.
6395	0				Thanks to the authors for a comprehensive chapter - their efforts are greatly appreciated. One overarching comment is that the chapter only mentions sustainable development and the SDGs in the context of response options, but does not look at how impacts will affect achievement of the SDGs. This would be very valuable to policy makers. [, Gambia]	Accepted. Treatment of SDGs has been focused in sevction 7.6.6 as space permits.
27307	0				The term "governance" is defined in a general way without a specific goal or aim. However, throughout the text the term governance is often used synonymous with "climate governance" e.g. in "adaptive governance" which has in itself has no aim, but it used only context of climate mitigation and policy. In this case "adaptive climate governance" should be used. [, Germany]	Accepted. Section changed to adaptive climate governance. However, adaptive governance is defined in the glossary.

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27309	0				The analysis deals only with "land tenure". It should also mention "water rights" or "water tenure", that in many legal traditions are associated with land rights or tenure and which are essential for successful farming. This aspect is independent from IWRM or flood risk management issues that are mentioned in the text. It is important to include water rights / water tenure when discussing land rights or tenure as these are inseparable. We therefore request including water rights / water tenure in the land tenure analysis in this Chapter. [, Germany]	we have considered literature on water tenure and its relation to land tenure, and also on acquisition of water rights as part of land grabbing, and added content in two places
27311	0				Please add confidence levels across the chapter please. [, Germany]	Accepted. Confidence levels added where appropriate.
29693	0				Thank you to the authors for a very useful chapter. The executive summary is very informative but we note that there is very little on limits to adaptation, which we consider to be an important element in this chapter. Adaptation barriers are only mentioned very briefly. A more comprehensive coverage of limits to adaptation (hard and soft), including those already encountered and those anticipated at higher levels of warming would be very useful [, Saint Lucia]	Limits to adaptation added to Executive Summary as space permitted.
12279	0				The climate link is much clearer in most sections than in the FOD. Great job! However, sometimes the specific land context is still weak. Also, the chapter seems far too long. Many sections are still rather conceptual and generic. Amongst others, the risk section and the decision-making and governance sections are not well-linked. [Hans Poertner and WGII TSU, Germany]	Accepted. Length has been examined and more focus attempted in decision making and governance as well as interlinking these sections.
12281	0				Uncertainty language is often not in the correct format/style. [Hans Poertner and WGII TSU, Germany]	Accepted. Revised.
12283	0				References to AR5 and SR15 should be (chapter-)specific. [Hans Poertner and WGII TSU, Germany]	Accepted and where appropriate revised.
12285	0				Structuring and subsections across the chapter are very diverse and sometimes confusing - this should be streamlined. [Hans Poertner and WGII TSU, Germany]	Rejected. Some sections have third order and others only second. It depends on the section. Because of the variation in topics, e.g. risk, decision making etc. standardization is not possible in the structure.
7367	1	1	1	1	I think here we need to incorporate sub-chapters for highschool even elementary students (who will be the near future land users, decision makers). The title for this part may be "What is awaiting youngsters in near future" [Erhan Akca, Turkey]	Rejected. Very good idea but beyond the scope of the mandate of this chapter.
14803	1	1	1	1	Suggested to provide synthesis/summary after each main section [Mahmood Riyaz, Maldives]	Rejected. Space not allowing for summary or synthesis. Language tightened to make clearer main points.
162	1	1	1	2	The title does not contain a reference to 'land' and could be misleading if not associated with land. [Tommy Wiedmann, Australia]	Rejected. Title of the chapter set by government agreement.
14771	1		200		This comment applies to the overall focus of this chapter. While downstream risks and impacts are important, assessment of this scope should also talk about agricultural science and engineering ethics. Although literature may have a broader coverage, the following paper would shed some light on citizen science engagement on controversial topics. Responsible innovation through conscious contestation at the interface of agricultural science, policy, and civil society, https://rdcu.be/bfROT [Laxmi Pant, Canada]	Accepted. Reference has been added to Citizen Science 7.7.4
1307	1		201		Overall the this chapter is nicely written, no more amendments are required. [Pushp Raj Tiwari, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Thank you.

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22865	1	1			This is an extremely important chapter that should put the research synthesis of the previous chapters in context of the knowledge available on risk and policy to respond to these findings. Unfortunately the chapter does not sufficiently build on the previous chapters. Instead, large sections 7.2, 7.3 and 7.4 make their own synthesis of the literature and do not build on the previous chapters that address the same issues. There are large inconsistencies between chapter 2 to 6 and what is mentioned in 7.2./3/4. The chapter can easily be made much more concise by just providing a short summary of the preceding chapters and then focussing on the substance of this chapter that starts from 7.5 onwards. At least the sections need to be made consistent and aligned with the earlier chapters. [Anastasios Kentarchos, Belgium]	Accepted. Burning embers has been added to 7.3 in cooperation with previous chapters and to align with them. Redraft of 7.2-7.4 considering othr chapters has occurred.
22867	1	1			Much of the literature used in the chapter is based on the integrated assessment of the SSP scenarios. However, there is a much wider literature relevant to what is discussed in this chapter and that should be better reflected. [Anastasios Kentarchos, Belgium]	Noted. Unclear which particular literature referred to.
22869	1	1			The executive summary is very long and in many places just repeating what is said in previous chapters (first page of summary) and very wordy in other places without really providing clear conclusions of literature evidence and actionable findings. Major findings with respect to policy action (the core topic of this paper) should be pushed forward to help governments learn from the science synthesized. Underlying theory belongs in the chapter but does not need to be put front in the summary. [Anastasios Kentarchos, Belgium]	Accepted. Major policy instruments have been pushed forward.
22871	1	1			By comparing the executive summary of this chapter with the extracts in Box 7.1 from previous IPCC reports a large overlap can be seen and it is not clear to what extent the current chapter goes beyond these previous conclusions. The executive summary (and the chapter as a whole) should make more clear what are the new science evidence. [Anastasios Kentarchos, Belgium]	Accepted. Comparison of Box 7.1 to ES made. ES focusing on new knowledge.
22873	1	1			Due to the length of the chapter that has a lot of repetition of previous reports and a lot of text on well-known concepts such as adaptive governance the key messages are difficult to find. At some places in the chapter strong overviews of the knowledge on different policy instruments is provided which is of high importance and informative to policy stakeholders. It is strongly recommended that strong editing is done on this chapter removing or condensing large sections that argue for well-known concepts such as adaptive governance and put more attention to the synthesis of literature on the available policy responses to risk and policy instruments available. This way the chapter can better reach its objectives and be made more relevant to policy stakeholders. [Anastasios Kentarchos, Belgium]	Accepted Revision of high level and more focus on particular new knowledge made.
22875	1	1			At several points in the chapter inconsistencies with previous chapters, mostly chapter 6 are found. The chapter should be carefully checked by authors from chapter 6 (and vice versa) to resolve inconsistencies [Anastasios Kentarchos, Belgium]	Accepted.

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12657	2	1	3	5	Governance (section 7.7) is related to the process of decision making (section 7.6). Policy is formed after the decision making process. It could be useful to have a diagram to show the inter-relationships between these three aspects. I am not certain of the reason why policy response is placed before decision making, I assume it is the presentation of the status quo. I am not sure if there is any literature on evaluating the current policy framework (at any level) and its adequacy is managing response to climate change. It would be interesting to have an additional section providing some indication of how governments might go about evaluating gaps and next steps. [Zelina Binti Zaiton Ibrahim, Malaysia]	Rejected. The IPCC can not be policy prescriptive. This chapter reviews the literature surrounding its indicative bullet points and title set by governments. It is based on governance as defined in the glossary and section 7.2/ 7.3. The process put forward in this comment is not consistent with multi level an polycentric governance in 7.7.2.
13333	3	1	3	3	I suggest the following change: The current geographic spread of the human unsustainable use of land, and the large and rapidly increasing appropriation negative impacts on functions and processes of multiple ecosystem services are unprecedented in human history. [Marina Rosales Benites de Franco, Peru]	Rejected. It is unclear where this change is suggested as page number and line are in the index.
3369	3	9	3	9	Based on the «Guidance Note for Lead Authors of the IPCC Fifth Assessment Report on Consistent Treatment of Uncertainties IPCC Fifth Assessment Report on Consistent Treatment of Uncertainties» , I am wondering if author can give the level of confidence for this finding is medium or high confidence? [Rongshuo Cai, China]	Rejected. It is unclear where this change is suggested as page number and line are in the index.
3371	3	18	3	19	I would suggest to use "high confidence" to replace (robust evidence, high agreement) and hereafter to follow the judgement and expression of «Guidance Note for Lead Authors of the IPCC Fifth Assessment Report on Consistent Treatment of Uncertainties IPCC Fifth Assessment Report on Consistent Treatment of Uncertainties» . [Rongshuo Cai, China]	Rejected. It is unclear where this change is suggested as page number and line are in the index.
10529	3	20	3	21	edit to make easier to read: influences global and regional climate through biogeophysical processes. [Jean-Luc Chotte, France]	Rejected. It is unclear where this change is suggested as page number and line are in the index.
21597	4	2	4	7	This is an introductory comment, it does not belong in an executive summary. Suggest deletion. [Andy Reisinger, New Zealand]	Noted. Paragraph deleted.
12287	4	2	4	7	This is more like a statement to justify the relevance of the report, but not really a key finding that is usually part of an Executive Summary, [Hans Poertner and WGII TSU, Germany]	Noted. Paragraph deleted.
6837	4	8	4	16	It is not clear which section here, and it does not match the relevant content of the chapter. please revised it. Changes in land-climate interactions will exacerbate the trend of ecosystems shifting to new biomes and permanent loss of insects, plants, and vertebrates (high agreement, medium evidence). In a 1.5°C scenario, combinations of climate and land change will likely drive 7% of current ecosystems, to new biome types, such as forest to grassland, and grassland to arid desert (high agreement, medium evidence). Risks increase with rising temperature and are not evenly distributed across regions (high confidence). To an increase likelihood of land degradation and desertification, as well as higher rates of food insecurity. At 1°C and 2°C, low-latitudes areas are most vulnerable to decreases in yields while in scenarios with over 3°C of global mean Temperature increase significant declines in yields across all regions of the world. [Changke Wang, China]	Noted. Paragraphs deleted.
30063	4	10	4	10	It is not clear where this 7% comes from. It cannot be found in chapter 7. It might be based on statement B.3.2 in the SPM of SR1.5. If so, that should be stated clearly and it should be explained in chapter 7 how the numbers in SR1.5 result in this 7%. In any case, it remains problematic that chapter 7 does not deal with shifts in ecosystems (and neither does chapter 4), so we doubt such a statement should be included at all. [, Netherlands]	Accepted. Paragraph deleted.

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31765	4	10	4	10	it would be better to say 'models indicate that.....' - 7% is a very specific number ! [Mike Morecroft, United Kingdom (of Great Britain and Northern Ireland)]	Noted. Paragraph deleted.
32271	4	14	4	14	low-latitude areas [Sofie Linder, Sweden]	Copyedit to be completed prior to publication.
21307	4	14	4	16	The last sentence of this para doesn't fit with the rest of the para, which is about change and loss. Consider moving to the following para. [, United Kingdom (of Great Britain and Northern Ireland)]	Noted. Paragraph deleted.
32273	4	17	4	17	Within the 1.5 degrees range of warming, threats increase significantly for human settlements near coasts [Sofie Linder, Sweden]	Noted. Paragraph deleted.
39917	4	17	4	19	The word 'to' is missing in the sentence. It should read "Within the 1.5 degrees range of warming, significant threats exist to human settlements[...]" [, United States of America]	Copyedit to be completed prior to publication.
6403	4	17	4	24	This is a very useful paragraph. Can anything be added here about threats already at 1 degree of warming? [, Gambia]	Noted. Paragraph deleted.
29695	4	17	4	24	It is not only ecosystems related to coral reef tipping points that are at risk, but also the communities that rely on them for food, livelihoods and coastal protection etc. [, Saint Lucia]	Noted. Paragraph deleted.
21309	4	18	4	18	What are 'ecosystems related to coral reef tipping points'? Also exist 'for' human settlements? Please clarify. [, United Kingdom (of Great Britain and Northern Ireland)]	Noted. Paragraph deleted.
17725	4	21	4	21	Unclear what the "may be very difficult to adapt to" actually means - what does the assessment imply? [, Sweden]	Noted. Paragraph deleted.
32275	4	21	4	21	may cause adaption difficulties [Sofie Linder, Sweden]	Copyedit to be completed prior to publication.
21311	4	25	4	25	Beyond localised economic effects' - more localised than country level? What would be the localised economic effect? Could you please clarify? This message could also be lifted to the SPM. [, United Kingdom (of Great Britain and Northern Ireland)]	Noted. Paragraph deleted.
39919	4	25	4	26	This headline is problematic in several respects: (1) it goes well beyond the report's intended focus on the land sector; (2) it implies that all 2°C scenarios have similar properties; and (3) it ignores the mitigation costs associated with limiting warming to 2°C. [, United States of America]	Noted. Paragraph deleted.
39921	4	25	4	32	This paragraph is outside the scope of the report (which the IPCC agreed would focus on climate change, the land sector and food security). It should be deleted or refocused on the topics agreed for the report. [, United States of America]	Noted. Paragraph deleted.
26041	4	25	4	32	No reference in the underlying text is given for this statement. In the AR5 (wg2, ch10) the global impact of 2C did not imply a large effect on economic growth. Suggest giving the underlying text reference and providing quantitative assessment rather than using the term "significant" which is ambiguous in this context. [Haroon Kheshgi, United States of America]	Noted. Paragraph deleted.
6397	4	25	4	37	It is very helpful to have information on the economic benefits of limiting warming to 1.5°C, but there is very little information here on adaptation costs and how these will increase with warming. Such information would be very useful. [, Gambia]	Noted. Economic cross chapter box expanded on adaptation costs.
17917	4	25	4	37	It could be helpful to say what this is compared with (i.e. 2 deg means lower economic growth than current levels or 1.5?) [Quentin Lejeune, Germany]	Noted. Chapter has been expanded with buning embers to compare levels of warming.
29697	4	25	4	47	These two paragraphs provide very valuable information and context about the economic implications of warming, the need for urgent action and the need to phase out fossil fuel subsidies. [, Saint Lucia]	Noted. Thankyou.
14781	4	27	4	27	"global inequalities" needs to be elobrated? Inequalities in what? Temperature ? Economic growth? Or impacts? [Mahmood Riyaz, Maldives]	Noted. Paragraph deleted.
32277	4	33	4	33	Sustainable Development Goals (SDGs) [Sofie Linder, Sweden]	Copyedit to be completed prior to publication.

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21601	4	33	4	34	The first sentence strikes me as rather trivial to be honest. A suite of policies is needed to address a complex global problem. Hm. The para would be far more powerful if this first sentence is deleted. But then you could work harder to emphasise the risk perspective (chapter 6 is saying something very similar - the value add from this chapter should be risk and risk management with an emphasis on policy solutions rather than statement of risks per se, these will come out clearly enough from chapter 6). [Andy Reisinger, New Zealand]	Noted. The Executive summary has been rewritten to explain the portfolios of policies.
39923	4	33	4	34	This sentence is policy-prescriptive; it should be refashioned or deleted. [, United States of America]	Rejected. The ES has been drafted to outline the policies needed to achieve the SSPs and targets of the Paris Agreement. The choice of level of warming is a state decision.
25665	4	33	4	37	These elements are well supported by scientific knowledge and are particularly policy-relevant. They should be kept. [, France]	Accepted. Retained.
14783	4	33	4	47	This para needs to be rephrased to incorporate the recent outcomes of COP 24 potential consequences and delays need to be addressed [Mahmood Riyaz, Maldives]	Accepted. ES and chapter expanded to include.
39925	4	34	4	35	This claim is vague and overly sweeping. What is meant by saying that "acting early will ... generate returns on investment"? [, United States of America]	Noted. ES and SPM expanded to detail costs and details surrounding acting early.
29699	4	37	4	38	This should rather state that "large-scale" land-based mitigation can entail risks that are underplayed. The report describes how many no regrets options exist which come with substantial co-benefits, so this statement should be made more specific so as not to contradict findings elsewhere in the report. [, Saint Lucia]	Noted. This line deals with small scale. Large scale response options dealt with in chapter 6 and 7.6.6
5225	4	37	4	43	These sentences seem to over-emphasize adverse effects of the land sector, which may risk leading to misunderstanding; and therefore, suggest adding "in the absence of appropriate climate and land policies". [, Japan]	Noted. Section has been revised.
1957	4	38	4	38	I suggest the authors introduce the acronym for IAM. [William Lahoz, Norway]	Noted acronym deleted.
25667	4	40	4	40	« Reforestation » should be replaced by "afforestation" as "reforestation" presents much less risk in terms of compromise with other sustainable development objectives, including food security. See GENERAL COMMENT ON AFFORESTATION AND REFORESTATION. [, France]	Noted. Paragraph revised.
32279	4	46	4	46	move to secure livelihoods (high agreement, [Sofie Linder, Sweden]	Copyedit to be completed prior to publication.
39927	4	34	5	45	These paragraphs contain a number of sweeping or overly generalized statements that are not well supported in the underlying chapter. They should be carefully revised to draw on the underlying text. A number of the statements lack confidence assessments. The fact that so many of the statements that do have confidence assessments have "agreement" that exceeds the "evidence" is itself an indication that the text may be venturing beyond the evidence base. [, United States of America]	Noted. The chapter has been refined to draw out policy portfolios and confidence statements when applicable. 7.5.8, 7.6.6, 7.7
21313	4		5		GENERAL comment on exec summary - some of this exec summary could be greatly shortened and better summarised, with overlaps removed. The language could also benefit from simplification (see specific comments). [, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Executive summary rewritten.
27313	4	1	7	37	Please try to streamline and shorten the Executive Summary and be more specific providing quantitative information whenever possible. Please add confidence statements and reformulate policy prescriptive statements. Please do not focus on 1.5 and 2 C but provide information up to 3 C which is coherent with estimated warming from current NDCs. [, Germany]	Accepted. Executive summary streamlined. Shortening didn't occur.

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17723	4	1	7	37	The language would need to be proof-read (there a quite a few issues with English language), and use of uncertainty language harmonised. Furthermore, use of references to chapter sections would be good to harmonise with the other chapters of the report. [Sweden]	Accepted. TOD will be copyedited and work on uncertainty language undertaken.
39915	4	1	7	37	A number of paragraphs in the Executive Summary lack sourcing to the underlying chapter, or contain poor and unclear syntax. [United States of America]	Copyedit to be completed prior to publication. Executive Summary rewritten.
10369	4	1	7	37	By comparing the executive summary of this chapter with the extracts in Box 7.1 from previous IPCC reports a large overlap can be seen and it is not clear to what extent the current chapter goes beyond these previous conclusions. The executive summary (and the chapter as a whole) should make more clear what are the new science evidence. [Jean-Luc Chotte, France]	Accepted. Comparison made and Executive summary revised.
7189	4	2	7	37	Since the mandate of this report was not about producing the report under a 1.5 scenario, the choice of using this scenario must be justified in the introduction to the ES. Perhaps, consider making a linkage to the SR1.5 in the introduction to the executive summary. [Debra Roberts, South Africa]	Noted. Paragraph deleted.
12289	4	2	7	37	Some sentences and paragraphs of this Executive Summary sound far more prescriptive than the Executive Summaries of other Chapters of this Special Report. Pointing out for example the benefits of certain actions will be more useful for the target audience of the Executive Summaries than a statement that tells readers what needs to be done or is necessary. [Hans Poertner and WGII TSU, Germany]	Rejected. Risk statements part of the mandate of the chapter.
31763	4		7		The executive summary makes frequent reference to the 1.5 degree special report. I don't think it is necessary to repeat this here [Mike Morecroft, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Reference to 1.5 reduced.
28455	4	1	201	4	Chapter 7 as an extremely important chapter that should put the research synthesis of the previous chapters in context of the knowledge available on risk and policy to respond to these findings. The UNCCD SPI would recommend to consolidate the pertinence of this chapter by reinforcing the links with the previous chapters. Instead, large sections 7.2, 7.3 and 7.4 make their own synthesis of the literature and do not build on the previous chapters that address the same issues. There are large inconsistencies between chapter 2 to 6 and what is mentioned in 7.2/3/4. The chapter can easily be made much more concise by just providing a short summary stressing on major findings with respect to policy action (the core topic of this paper) should be pushed forward to help governments learn from the science synthesized. Underlying theory belongs in the chapter but does not need to be put front in the summary. At least the sections need to be made consistent and aligned with the earlier chapters. On the whole, the executive summary (and the chapter as a whole) should make more clear what are the new science evidence (Much of the literature used in the chapter is based on the Integrated Assessment of the SSP scenarios. However, there is a much wider literature relevant to what is discussed in this chapter and that should be better reflected). [Barron Joseph Orr, Germany]	Accepted. 7.2-7.4 have been more closely aligned to previous chapters especially with burning embers. Executive summary has been redrafted.

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10361	4	1	201	4	The UNCCD SPI reviewers consider this chapter 7 as an extremely important chapter that should put the research synthesis of the previous chapters in context of the knowledge available on risk and policy to respond to these findings. The UNCCD SPI would recommend to consolidate the pertinence of this chapter by reinforcing the links with the previous chapters. Instead, large sections 7.2, 7.3 and 7.4 make their own synthesis of the literature and do not build on the previous chapters that address the same issues. There are large inconsistencies between chapter 2 to 6 and what is mentioned in 7.2/3/4. The chapter can easily be made much more concise by just providing a short summary stressing on major findings with respect to policy action (the core topic of this paper) should be pushed forward to help governments learn from the science synthesized. Underlying theory belongs in the chapter but does not need to be put front in the summary. At least the sections need to be made consistent and aligned with the earlier chapters. On the whole, the executive summary (and the chapter as a whole) should make more clear what are the new science evidence (Much of the literature used in the chapter is based on the Integrated Assessment of the SSP scenarios. However, there is a much wider literature relevant to what is discussed in this chapter and that should be better reflected). [Jean-Luc Chotte, France]	Accepted. 7.2-7.4 have been more closely aligned to previous chapters especially with burning embers. Executive summary has been redrafted.
10363	4	1	201	4	General: This is an extremely important chapter that should put the research synthesis of the previous chapters in context of the knowledge available on risk and policy to respond to these findings. Unfortunately the chapter does not sufficiently build on the previous chapters. Instead, large sections 7.2, 7.3 and 7.4 make their own synthesis of the literature and do not build on the previous chapters that address the same issues. There are large inconsistencies between chapter 2 to 6 and what is mentioned in 7.2./3/4. The chapter can easily be made much more concise by just providing a short summary of the preceding chapters and then focussing on the substance of this chapter that starts from 7.5 onwards. At least the sections need to be made consistent and aligned with the earlier chapters. [Jean-Luc Chotte, France]	Accepted. 7.2-7.4 have been more closely aligned to previous chapters especially with burning embers. Executive summary has been redrafted.
10365	4	1	201	4	General: Much of the literature used in the chapter is based on the Integrated Assessment of the SSP scenarios. However, there is a much wider literature relevant to what is discussed in this chapter and that should be better reflected. [Jean-Luc Chotte, France]	Noted. Additional literature welcome.
10367	4	1	201	4	General: The executive summary is very long and in many places just repeating what is said in previous chapters (first page of summary) and very wordy in other places without really providing clear conclusions of literature evidence and actionable findings. Major findings with respect to policy action (the core topic of this paper) should be pushed forward to help governments learn from the science synthesized. Underlying theory belongs in the chapter but does not need to be put front in the summary. [Jean-Luc Chotte, France]	Accepted. Executive summary rewritten.
21609	4	1			There are at least 3 paragraphs in this executive summary that seem to say that coherent policy mixes are important - which seems unlikely to strike most policymakers as very helpful insight. Please try to condense and focus different paras on more distinctly different conclusions. [Andy Reisinger, New Zealand]	Accepted. Executive summary rewritten.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
21611	4	1			Overall in this executive summary there seems to be little specific to policies that achieve mitigation outcomes; I would have expected a much more concise set of conclusions relating to the role of carbon pricing and barriers to more ambitious mitigation policies (including risk of leakage, concerns about loss of competitiveness, rural livelihoods and system transitions driven by rapid policy change), and the critical role of improving MRV to allow more nuanced agricultural mitigation policies that can connect with other development objectives. This is a key area of interest (and highly sensitive, so needs care!) but currently I'm getting very little on this from this draft executive summary. [Andy Reisinger, New Zealand]	Accepted. This topic has been expanded in areas suggested in other comments by this reviewer.
12501	4	2		7	The bold sentence is fine but I would suggest to then go into chapter findings rather than describe chapter rationale here. [Hans Poertner and WGII TSU, Germany]	Noted. Paragraph deleted.
12503	4	7		24	While the statements on 1.5 and 2 are appreciated chapter findings and ES should also go beyond those scenarios when assessing the risk increments. [Hans Poertner and WGII TSU, Germany]	Noted. First four paragraphs deleted. Burning embers expanded to deal with thresholds.
3699	4	33		47	Possible to separate this text in two paragraphs? [Cordula Ott, Switzerland]	Copyedit to be completed prior to publication.
12505	4	33		47	Quantifying the risk thresholds /transitions may help specifying this text and make it more meaningful. [Hans Poertner and WGII TSU, Germany]	Accepted. Burning embers has been added to expand on risk thresholds.
21603	5	1	5	2	I'm not convinced that this chapter has provided the evidence to support this statement. For one, IPCC has for several assessments now stayed away from comparing the monetary costs of action and inaction because monetising risks and impacts would require value judgements that are difficult for the IPCC to make. But more importantly, given the global nature of GHG emissions, this statement relies on an assessment of mitigation costs and impacts across all sectors, which is well beyond the scope of this report (and AR5 does not have a simple conclusion on this that could be used here). [Andy Reisinger, New Zealand]	Noted. We have revised the statement to reflect the available literature and the material in our chapter.
6399	5	1	5	2	This is a really important and useful statement - that the cost of inaction is greater than the cost of action to manage land sustainably and to mitigate and adapt [, Gambia]	noted.
12291	5	1	5	2	The first statement here needs a confidence level. [Hans Poertner and WGII TSU, Germany]	Accepted and added
39929	5	7	5	7	"Certain characteristics of decision making" is unclear in this sentence. Could this be replaced with "Different policy scenarios ..."? [, United States of America]	Noted, revised
10371	5	11	5	11	The issue of harmful policies that counteract coherent policy mixes are an important finding and highly relevant message. This type of messages needs to be pushed forward and made more visible in the executive summary. [Jean-Luc Chotte, France]	noted.
22877	5	11	5	12	The issue of harmful policies that counteract coherent policy mixes are an important finding and highly relevant message. This type of messages needs to be pushed forward and made more visible in the executive summary. [Anastasios Kentarchos, Belgium]	Noted.
39931	5	13	5	17	"A socio-economic pathway based on regional rivalry (with limited regulation of land use, low technology development, resource intensive consumption, constrained trade, and delayed international cooperation on mitigation) can result in food prices increases, with strong impacts in the Middle East, Africa and Asia, high numbers of people flooded and significant loss of forest (high agreement, limited evidence)." As written, this sentence is not clear or coherent. Suggest rephrasing to communicate the intended point. [, United States of America]	Noted and addressed.

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32881	5	13	5	21	Be careful to avoid reification of abstract pathways. Pathways don't themselves lead to high or lower food prices. Adjust wording so that the subject, verb, object make sense together. [Doreen Stabinsky, United States of America]	Noted and addressed.
32281	5	15	5	15	food price increases [Sofie Linder, Sweden]	Copyedit to be completed prior to publication. Executive Summary rewritten.
5227	5	17	5	21	Suggest modifying "increases in forested land" to "conservation and/or increases in forested land "as conservation is also important [, Japan]	Copyedit to be completed prior to publication.
32283	5	20	5	21	and increases forested land. [Sofie Linder, Sweden]	Copyedit to be completed prior to publication.
21701	5	20	5	21	The phrase here seems to imply that increases in forested land are in themselves a good outcome but this depends on what the purpose is: climate policy is not simply increasing forest cover, but building a more resilient and adaptive outcome. Moreover, any discussion of forested land also needs a discussion of the nature, quality, and diversity of that forest cover. [Timothy Forsyth, United Kingdom (of Great Britain and Northern Ireland)]	Noted and thank you.
25669	5	21	5	21	This reference should be checked. [, France]	Not clear which reference is being referred to?
21605	5	22	5	27	My sense is that this para is trying to bite off more than it can chew - assessment of carbon pricing (especially fossil fuel subsidies as in the body of the chapter) is well outside the scope of the report. On the other hand, I believe that a clear statement that including agricultural emissions in climate policies, and ensuring that over time those emissions are exposed to full carbon prices so that the mitigation potential assessed in this report can be realised, would be an incredibly important and powerful statement. Chapter 5 and 6 in particular demonstrate this reasonably clearly, so the opportunity now exists for this chapter to make clear to decision-makers that they won't get the mitigation potentials assessed in this report unless they bring agriculture into the mainstream of climate policy (which it currently isn't). I.e. in the long run, one can't drive agricultural climate policy based on co-benefits only. If the authors agree, then this would be a very important statement to make. [Andy Reisinger, New Zealand]	Accepted, the paragraph has been changed to reflect these suggestions
39933	5	22	5	27	The statement is policy-prescriptive. What would constitute a "well-designed" carbon tax? [, United States of America]	paragraph has been re-worded
32883	5	24	5	25	What is "well-designed"? Equity should be mentioned explicitly here. A carbon tax that is inequitably applied understandably can trigger reactions such as those of the gilets jaunes in France. [Doreen Stabinsky, United States of America]	paragraph has been re-worded, and equity added
14785	5	25	5	25	" A well-designed carbon tax" needs to defined, mention examples if there is [Mahmood Riyaz, Maldives]	paragraph has been re-worded
39935	5	28	5	45	This paragraph contains a number of prescriptive statements, including the claim on lines 41-45 that various named interventions "... may present the only viable and robust ways to increase the productivity, sustainability, and resilience of peasant-based [sic] agricultural production under predicted climate scenarios." [, United States of America]	Accepted. Paragraph rewritten.
31767	5	28	5	45	this paragraph isn't really appropriate to an executive summary of this sort - it reads more like an introduction. I suggest removing or replacing it with a shorter summary statement [Mike Morecroft, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Paragraph rewritten.
39937	5	30	5	31	This sentence should read "The combination of policy instruments -- rather than a single policy - responds to risks so society can prepare for, respond to, and recover from these climate change-land impacts." [, United States of America]	Accepted. Executive Summary rewritten.

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32285	5	31	5	31	from land-climate change impacts. [Sofie Linder, Sweden]	Copyedit to be completed prior to publication.
32287	5	31	5	32	For example, a suite of policy instruments to improve flood resilience will include flood zone mapping, flood zone building restrictions, financial incentives [Sofie Linder, Sweden]	Copyedit to be completed prior to publication.
32885	5	37	5	45	The treatment of agroecology in this paragraph and underlying section is more accurate than treatments in other chapters of the report. There should be some effort to reflect agroecology similarly across the chapters. [Doreen Stabinsky, United States of America]	Noted. Chapter coordination advanced.
21315	5	37	5	45	This should be a new paragraph with the messages lifted to the SPM. [, United Kingdom (of Great Britain and Northern Ireland)]	Content provided for consideration to SPM.
27315	5	38	5	41	The statement "Additional research has suggested that high levels of on-farm biodiversity, polycultures, agroforestry systems, crop-livestock mixed systems accompanied by organic soil management, water conservation and harvesting, and traditional farming and risk management practices may present the only viable and robust ways to increase the productivity, sustainability and resilience of peasant-based agricultural production under predicted climate scenarios." needs further clarification. Please define "peasant-based agricultural production", does this refer to poor or to small-scale farmers or to both? [, Germany]	Accepted. Parts deleted and other rewritten.
10519	5	40	5	40	replace organic soil management with soil organic carbon management [Jean-Luc Chotte, France]	Noted. Wording revised.
21607	5	41	5	41	"may present the only viable and robust way" strikes me as both overly prescriptive (really? The ONLY way - no nuance, no context-dependence?) and, given the use of "may" as actually quite weak. Please avoid generalisation and absolute statements that, given the diversity and complexity of systems, will be difficult to support. [Andy Reisinger, New Zealand]	Accepted. Revised.
17727	5	42	5	42	"Projected" rather than "predicted", to align with WG1. [, Sweden]	Copyedit to be completed prior to publication.
10373	5	43	5	43	While the summary in general does not provide a lot of detail on specific policy options here very specific options like financial support for pipelines are provided. Unfortunately it is just this option that has seen a lot of failures (well documented in the literature) as such technologies lacked maintenance, were not locally supported etc etc. It is dangerous to highlight a specific policy option here that has so much inconclusive/context dependent evidence. [Jean-Luc Chotte, France]	Accepted. Section revised. Specific justification for referring to non land based carbon pricing instruments provided in text in relation to agricultural sector. Without the former, the probability of the latter reduces if not disappears.
22879	5	43	5	45	While the summary in general does not provide a lot of detail on specific policy options here very specific options like financial support for pipelines are provided. Unfortunately it is just this option that has seen a lot of failures (well documented in the literature) as such technologies lacked maintenance, were not locally supported etc etc. It is dangerous to highlight a specific policy option here that has so much inconclusive/context dependent evidence. [Anastasios Kentarchos, Belgium]	Rejected. Policies covered in 7.5. No literature provided for reviewer's assertion.
31769	5	46	5	47	this isnt a statement which warrants a confidence assessment - remove. [Mike Morecroft, United Kingdom (of Great Britain and Northern Ireland)]	Thank you, but we maintain that a confidence statement is appropriate here
17729	5	48	5	48	It is not very clear what the unreliability and technology limitation refer to viz. uncertainty in scientific findings. [, Sweden]	Noted, revised
40837	5		5		Where is the assessment of economic cost of action and inaction? AR5 was not able to do it; SR15 was neither. This is puzzling. [Valerie Masson-Delmotte, France]	Thank you, we have assessed the available literature on the economic costs of action and inaction. Although the literature is difficult to compare due to differences in methodologies, assumptions, scope, timeframes etc, we believe there is still sufficient to make a statement such as this, although we have revised the wording somewhat in response to your comment.

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3701	5	1		2	Part of the paragraph above? [Cordula Ott, Switzerland]	Copyedit to be completed prior to publication.
3703	5	1		20	Possible to make two paragraphs - good and bad examples: It is then more easy to capture the content [Cordula Ott, Switzerland]	Copyedit to be completed prior to publication.
12507	5	1		21	This bullet point appears overly long and could be split in two or even three. More specific and quantified statements should illustrate findings. Can the policy mixes be specified more, e.g. one or more examples? [Hans Poertner and WGII TSU, Germany]	Accepted and addressed
3705	5	28		45	Possible to make two paragraphs. Or reduce [Cordula Ott, Switzerland]	Accepted. Paragraph rewritten.
12509	5	34		38	Can examples for successful policy instruments be included? Same for diverse agroecological practices. [Hans Poertner and WGII TSU, Germany]	Accepted. Examples added.
12511	5	38		42	This statement is specific and sends a clear message. [Hans Poertner and WGII TSU, Germany]	Noted. However paragraph rewritten.
31771	6	8	6	9	this is true nit isnt a statement which warrants a confidence assessment - remove confidence assessment [Mike Morecroft, United Kingdom (of Great Britain and Northern Ireland)]	We have changed the bolded statement in the new version of the paragraph but have given it the confidence statement it merits, according to the practice for writing summaries
29809	6	8	6	10	Tsleil-Waututh supports the concept that traditional and local knowledge systems are important considerations in formal decision-making analysis. It is now time to better integrate, mainstream and learn from those sources of knowledge. [Tanya Smith, Canada]	The integration of ILK into formal decision-making is now more clearly expressed in the new Executive Summary and in the Cross-Chapter Box on ILK
32887	6	15	6	17	Include farmer-to-farmer and farmer-scientist partnerships (such as MASIPAG in the Philippines) in this discussion. [Doreen Stabinsky, United States of America]	Integration of ILK and science is now discussed in the Cross-Chapter Box on ILK.
39939	6	15	6	17	The word 'and' is missing in the sentence. It should read "... and water users' group are also important considerations in formal decisionmaking analysis (7.5.1)." [, United States of America]	Copyedit to be completed prior to publication.
32289	6	16	6	16	groups and water users' groups are [Sofie Linder, Sweden]	Copyedit to be completed prior to publication.
21613	6	18	6	30	It would be good to have more on barriers in this para - why are these approaches not practiced more widely, how can barriers be overcome? [Andy Reisinger, New Zealand]	Accepted. Executive summary amended.
12293	6	29	6	29	Specify "service delivery". [Hans Poertner and WGII TSU, Germany]	Taken into account. Text has been deleted due to space constraints.
32889	6	31	6	35	Include this gender treatment in the SPM. [Doreen Stabinsky, United States of America]	Accepted. Gender has been proposed in the spm.
12295	6	31	6	35	Suggest to make turn this paragraph into a separate headline statement and add confidence level. [Hans Poertner and WGII TSU, Germany]	Accepted. Gender has been expanded into a specific paragraph.
39941	6	32	6	33	"... competing uses for land (such as biofuel) ..." Why single out only one of many potential competing land uses? Suggest deleting the text in parentheses. [, United States of America]	Agreed and accepted; competition for land is anyway addressed primarily in Chapter 6 of this report.
39943	6	40	6	40	"... targets established in the Paris Agreement ..." Does this refer to nationally determined contributions? If so, say so. There are no specific targets established in the Paris Agreement. There is a global temperature goal. [, United States of America]	Noted, addressed
32291	6	40	6	40	SDGs [Sofie Linder, Sweden]	Copyedit to be completed prior to publication.
10521	6	40	6	41	UNCCD SPI comments in FOD addressed which will make this easier to use for policy development -- providing reference to LDN indicators allows an important entry point for policies related to the mission of the UNCCD and for SDG 15 [Jean-Luc Chotte, France]	Noted
39945	6	41	6	42	"... measurement and monitoring for REDD ..." The correct term is "REDD+," to encompass all five activities included in para 70 of UNFCCC decision 1/CP16. [, United States of America]	Noted, addressed

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17505	6	42	6	42	Better to use "REDD+" instead of "REDD", as in the rest of the document, to avoid questions of whether the use of different acronyms was intentional (and given that REDD and REDD+ are often interpreted slightly differently) [Dirk Nemitz, Germany]	Accepted. Executive Summary rewritten.
25671	6	42	6	42	It is REDD+ instead of REDD. It should be corrected. [, France]	Accepted. Executive Summary rewritten.
40841	6		6		Hunting is mentioned here (line 13) but no where else in the report (to check). Is this a gap? Is hunting part of land use and food systems? If yes I see a gap here. [Valerie Masson-Delmotte, France]	The reference to hunting has been removed from the Executive Summary. Coverage of hunter-gatherer systems is maintained in the Cross-Chapter Box on ILK
22881	6	46	7	7	This point is true but can be merged with earlier points on adaptive decision making, the current text is full of very nice words (disruptive threats, tipping points, regime shifts, windows of opportunity, dynamic adaptation pathways etc) that are not easily understood and are non-conclusive to the reader (it resembles 'buzzword lingo'). It is here sufficient to use the bold text and integrate this with one of the earlier summary points (or with the final sentences of the next point that again introduces the adaptive approach). [Anastasios Kentarchos, Belgium]	Noted, addressed
10375	6	46	7	7	This point is true but can be merged with earlier points on adaptive decision making, the current text is full of very nice words (disruptive threats, tipping points, regime shifts, windows of opportunity, dynamic adaptation pathways etc) that are not easily understood and are non-conclusive to the reader (it resembles 'buzzword lingo'). It is here sufficient to use the bold text and integrate this with one of the earlier summary points (or with the final sentences of the next point that again introduces the adaptive approach). [Jean-Luc Chotte, France]	Noted, addressed
12513	6	1		7	It seems that a timeframe is needed to put these findings into perspective, [Hans Poertner and WGII TSU, Germany]	Rejected. Time frame of adaptive management is flexible and dependent on context.
12515	6	8		17	Bullet could be more specific what local and indigenous knowledge entails and could also be more specific of where the climate related limits to relevant adaptation strategies are, providing access to residual risk. [Hans Poertner and WGII TSU, Germany]	The new Executive Summary bullet, within space constraints, addresses both these points
12517	6	22		25	Can this be specified a bit more by providing an example? [Hans Poertner and WGII TSU, Germany]	Taken into account. Text has been deleted due to space constraints.
3707	6	31		35	Would be worth to make a specific paragraph out of this: title: Taking into account gender differences and empowering women [Cordula Ott, Switzerland]	Accepted. Gender has been expanded into a specific paragraph.
12519	6	36		37	Unclear what kind of performance is referred to? [Hans Poertner and WGII TSU, Germany]	Noted, rephrased
32891	6	40			Technically the Paris Agreement does not establish targets. More accurate language would be "long-term goals". [Doreen Stabinsky, United States of America]	Noted, addressed
5229	6	42			Suggest modifying "REDD" to "REDD+" [, Japan]	Copyedit to be completed prior to publication.
32893	7	2	7	3	This sentence is rather unintelligible and should be reworded. [Doreen Stabinsky, United States of America]	Accepted
21317	7	2	7	5	This sentence is impenetrable, please simplify/clarify. What is privileging equilibrium? [, United Kingdom (of Great Britain and Northern Ireland)]	Accepted
17731	7	3	7	3	"privileging equilibrium" is rather unclear. [, Sweden]	Accepted. Privileged equilibrium has been removed
10523	7	8	7	8	include post harvest losses [Jean-Luc Chotte, France]	The paragraph has been rewritten to focus more clearly on land tenure, and we believe mention of post-harvest losses would not be appropriate

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32293	7	8	7	10	Local factors such as land tenure and food production access, affects the degree to which policy instruments create opportunities to decrease poverty, food and livelihood insecurity, i dont understand the context or the meaning of the sentence but possibly this can be a solution [Sofie Linder, Sweden]	This paragraph has been extensively rewritten
10525	7	18	7	18	replace system linkages with ecosystem services [Jean-Luc Chotte, France]	This paragraph has been rewritten and most of the second half deleted - including the sentence referred to - moved elsewhere
32295	7	19	7	19	SDGs [Sofie Linder, Sweden]	Copyedit to be completed prior to publication.
17733	7	22	7	23	In line with section 7.2.2, it would seem to be a misrepresentation to say that there is a gap/omission of freshwater ecosystems in the SDGs. Rather, there is not an explicit goal for them, which is something different. (And what about Aichi Biodiversity Targets?) [, Sweden]	Accepted. ES revised and this issue has been clarified in 7.6.6
39947	7	22	7	24	"The gaps and omissions in Sustainable Development Goals (e.g., freshwater ecosystems and their ecosystem services) require other frameworks such as Nature's Contribution to People (NCP) to be considered as well." This is policy-prescriptive and should be deleted. [, United States of America]	Accepted ES revised and this issue has been clarified in 7.6.6
17735	7	24	7	24	Nature's Contributions to People is one framing, Ecosystem services another, with some disagreement across the community. The latter may be more familiar to many readers. Should consider choice of framing, or cite both. Cf. Cross-Chapter Box 7, as well as section 7.6 in which NCP is termed "emerging". [, Sweden]	Accepted. See 7.6.6 and 7.5 ecosystems payments.
1959	7	24	7	24	As in Chapter 6, I suggest provision of more details of the concept of NCP. [William Lahoz, Norway]	Noted.
32895	7	24	7	27	Passive voice coupled with undefined jargon (an adaptive management approach) makes this sentence rather difficult to understand. [Doreen Stabinsky, United States of America]	Accepted. Rewritten.
21319	7	24	7	28	The last two sentences of this para would fit bit better in the preceding paragraph about interactions and uncertainty. [, United Kingdom (of Great Britain and Northern Ireland)]	Accepted and revised
12297	7	27	7	28	Specify the "nexus approach" in the context of SRCL. [Hans Poertner and WGII TSU, Germany]	Accepted
22883	7	29	7	37	This last point is probably one of the most specific and important finds: other chapters indeed indicate the assumed high role of biomass and its disruptive tradeoffs and conflicts on other dimensions. This has strong land use governance impacts (far beyond the land tenure rights plea in Ch 6). Suggestion to prioritise this finding in the summary and make the text more specific, the last sentences are pure terminology again: 'multi-level governance, inclusive governance with deeper engagement etc. Avoid terms and be specific on the needs indicated based on the review of literature. Avoid confusing terms like multi-level and inclusive (there is overlap but also a difference). [Anastasios Kentarchos, Belgium]	Noted. See above reply; reviewer comment was repeated.
39949	7	29	7	37	This paragraph contains a number of prescriptive statements. [, United States of America]	Rejected, we do not advocate here specific policies but only broad approaches; the statements arise directly from the 1.5 report and from scenarios that show an increasing role for land and bioenergy in relation to impacts, targets, etc. It doesnt mean these options have to be taken, but rather that there is evidence that they will be significant or required.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
10377	7	29	7	37	This last point is probably one of the most specific and important finds: other chapters indeed indicate the assumed high role of biomass and its disruptive tradeoffs and conflicts on other dimensions. This has strong land use governance impacts (far beyond the land tenure rights plea in Ch 6). Suggestion to prioritise this finding in the summary and make the text more specific, the last sentences are pure terminology again: 'multi-level governance, inclusive governance with deeper engagement etc. Avoid terms and be specific on the needs indicated based on the review of literature. Avoid confusing terms like multi-level and inclusive (there is overlap but also a difference). [Jean-Luc Chotte, France]	Accepted, however note that bioenergy is discussed in two cross-chapter boxes that aim to clarify with more specifics, and so part of the response to this comment can be found in those Boxes.
32897	7	30	7	32	The presence of biomass in scenario pathways should not be reified as what action in the land sector is actually needed to stay below 1.5C. See the significant literature review of Dooley et al. (2018) on missing pathways. There is no "increasing role." What role there may or may not be is yet to be determined. [Doreen Stabinsky, United States of America]	Rejected - unclear what change reviewer asks for here. Land use emissions are increasing considerably already so significance is clear. With respect to bioenergy, some 1.5 scenarios have even more bioenergy without BECCS than with BECCS. So the point on significance of land use and increasing role of bioenergy is valid. The point is that land use is tightly coupled with meeting 1.5 targets, and this could require fairly significant increases in (modern) bioenergy, with or without BECCS - this is different issue than the methodological issue that the reviewer notes about missing pathways. There can always be other pathways not yet developed, so the reviewer's point is not in conflict.
29701	7	30	7	32	This is an important statement - increasing reliance on bioenergy will require integrated approaches to land-use governance. But this could also be extended to other forms of land-based mitigation, e.g. reducing deforestation and forest/ecosystem resotration (which are hardly mentioned in the exec summary) [, Saint Lucia]	Accepted, although integrated responses are covered in Chapter 6, this chapter aims to complement that chapter, and thus we have tried to generalise the notion of integrated approaches. This concept has also been brought into the cross-chapter box on Bioenergy and BECCS.
18249	7	33	7	33	MA not formally introduced [Julia Nabel, Germany]	Unclear what MA refers to.
12299	7	40	7	46	This part can be cut. The following more specific introduction to the structure of the chapter is sufficient. [Hans Poertner and WGII TSU, Germany]	We feel an introductory paragraph for the chapter is necessary, but have shortened and reduced duplication with 7.2.3 - which has also been shortened
32297	7	46	7	46	SDGs [Sofie Linder, Sweden]	Copyedit to be completed prior to publication.
14767	7	1	8	7	Conceptual clarity about tipping point and regime in socio-ecological systems and regime shift in socio-technical systems. While the former holds regime shift as a negative change while this a desirable change in socio-technical systems (Chapter 4 has discusses socio-technical transsion and socio-technical regime shifts). For example, it involves the regime shift from productivist to post-productivist agriculture. There are referred journal articles that talk about how they compare each other and what integrative frameworks are desirable. Chapter 5 also discusses some elements of this and it would be helpful to discuss it here as well. This conceptual clarity would also help address the issues of just transition, a hot topic in COP24. [Laxmi Pant, Canada]	Noted.
3713	7	46	8	4	Sentence too long and complicated [Cordula Ott, Switzerland]	Copyedit to be completed prior to publication.
17921	7	1			In this section or elsewhere in the report there should be a discussion of how land is treated in the NDCs (e.g. what different methods have been used to set targets for emissions / removals from land use, land use change and forestry), as well as the uncertainties in the overall contribution of land-based mitigation to the NDCs on aggregate. As elements of this are covered in chapter 2 it would be helpful to clearly cross-reference. [Quentin Lejeune, Germany]	Rejected. Chapter 2 has a discussion. However, researching the individual content of the NDCs beyond the scope of the chapter.

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3709	7	8		28	Too many ideas included in this paragraph... therefore difficult to understand ... splitting might make sense [Cordula Ott, Switzerland]	This paragraph has been rewritten and most of the second half deleted or moved elsewhere
27317	7	27			The reference to the nexus approach might seem like a recommendation which would not be appropriate for the IPCC. In addition, it contradicts statement on page 94 that states that this approach is not comprehensive. Please revise. [, Germany]	Accepted
3711	7	41		42	This sentence is duplicating the sentence below (Line 46)? or different content? [Cordula Ott, Switzerland]	Copyedit to be completed prior to publication.
22021	7				Explicit involvement of water resources interaction and close interrelated strings with served watershed ecosystem... potential adverse effects for any adaptive measure considered on water bodies... or indicate the need for further investigations on that matter in future publications or studies [Hala Abayazid, Egypt]	Comment unclear
25673	8	15	8	15	Some of the key results of SR15 are not sufficiently taken into account. In particular, the key messages in sections D3, D4.4, D4.5, D5 and D6 from the SR15 SPM should be better reflected, particularly relevant for the paragraphs about "climate change and sustainable development pathways", "decision-making", and "adaptation" of the box 7.1. [, France]	Two references to SR15 were already in the SOD Table but more have been added, using the suggestions made here
24795	8	25	8	35	These lines don't add value to the main point / purpose of the section ("climate change and sustainable development pathways". Consider deleting. The lines 36 - 39 contain the main point. Almost everything else could be deleted. [Justice Issah Musah Surugu, Germany]	We respectfully disagree. The bullet points in lines 25-35 contain important findings that are not summarised in Lines 36-39
15117	8	28	8	32	Given "The design of climate policy is influenced by: (1) differing ways that individuals and organisations perceive risks and uncertainties...", see previous comment. [Gordon Macdonald, Canada]	We do not understand this comment or what previous comment is referred to.
24797	8	41	8	45	These lines don't add value to the main point / purpose of the section ("climate change and sustainable development pathways"). Consider deleting because it doesn't really increase the evidence and taking it out also doesn't REDUCE the evidence. [Justice Issah Musah Surugu, Germany]	The lines referred to constitute a new sub-section on "Land and rural livelihoods" and are not part of the sub-section on "climate change and sustainable development pathways". They constitute important land-related findings of previous assessments. Tightening links between this section and the land-climate challenges was requested by other reviewers.
22885	8	15	9	32	This box largely repeats the exec summary of previous chapters and presents a cherry picking of phrases across reports often lacking context. As this box is not essential and largely part of previous chapters I would rather see it replaced by a box that indicates the policy relevant issues concluded in previous chapters that require treatment in this chapter. General, not very useful, remarks such as 'Adaptation is a complex process' need to be avoided. [Anastasios Kentarchos, Belgium]	Other reviewers favoured retaining the box, and indeed expanding it with findings from SR15. The findings highlighted relate specifically to sustainable development, decision-making and governance - the foci of this chapter. The statement that adaptation is a complex social process has been deleted.
27319	8	15	9	32	Box 7.1. refers to previous IPCC-reports but the references are unclear: please cite IPCC reports with their names that are known to the readers. [, Germany]	We considered this, but with almost 20 references in this box, presenting them by their titles as well the reports and volumes they appeared in would have been very complicated and increased length
10379	8	15	9	32	This box largely repeats the exec summary of previous chapters and presents a cherry picking of phrases across reports often lacking context. As this box is not essential and largely part of previous chapters I would rather see it replaced by a box that indicates the policy relevant issues concluded in previous chapters that require treatment in this chapter. General, not very useful, remarks such as 'Adaptation is a complex process' need to be avoided. [Jean-Luc Chotte, France]	Other reviewers favoured retaining the box, and indeed expanding it with findings from SR15. The findings highlighted relate specifically to sustainable development, decision-making and governance - the foci of this chapter. The statement that adaptation is a complex social process has been deleted.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
23533	8	2			This section describes the various definitions of risks, their characteristics and drivers, their dynamics and their impact on humans. However, there is a lack of multi-risk assessment and its management content. [Huai Jianjun, China]	Rejected. Peer review literature not provided on multi risk assessment. Chapter has covered comprehensive risk management in 7.5.7, and concepts such as adaptation pathways 7.7.3, and framing of risk for decision making in 7.6. Literature on another facet of risk management welcome.
12301	8	8			This subsection (7.2.1) can be removed, since it only hosts a box (which could be placed in the introduction, too), without any further assessment. [Hans Poertner and WGII TSU, Germany]	We felt it important to highlight the importance of previous IPCC findings. Having this as a separate subsection does not add to overall length
21615	8	15			Why does this box not cite any findings from the SR15 (on carbon pricing, transformations, etc?) [Andy Reisinger, New Zealand]	Two references to SR15 were already in the SOD Table but more have been added
12303	8	15			The quotes and definitions are presented partly without any context or link to the land challenges. It might be more useful to refer to the findings from previous assessments in the respective sections of this chapter, and relate them directly to the land challenges. [Hans Poertner and WGII TSU, Germany]	Many of the findings presented here do not map one-to-one to specific sections of this chapter, so keeping them in one place works better. We have added wording to the text above the table to make the links to land challenges more explicit.
24799	9	1	9	6	Delete lines 1-6 (lines 7-8 provide maintain the argument). No evidence lost by deleting lines 1-6 (taken from the same author, and lines 7-8 is a summary of lines 1-6). [Justice Issah Musah Surugu, Germany]	We respectfully suggest that lines 7-8 are not a summary of lines 2-6, but a specific point on *residual* risk.
21321	9	19	9	23	Section on adaptation is unnecessary as adaptation features throughout. Suggest moving this section to the governance section. [United Kingdom (of Great Britain and Northern Ireland)]	Accepted
14787	9	20	9	20	Adaptation is a complex "social" process why is it only a social process?? Why not physical?? [Mahmood Riyaz, Maldives]	Statement now deleted
40843	9		9		link to SR15 and SROCC missing [Valerie Masson-Delmotte, France]	References to SR15 were already in the SOD Table but more have been added. Relative timetables for approval prevent us including findings from SROCC
21323	10	1	10	47	Consider including 'tipping point' as a key term. [United Kingdom (of Great Britain and Northern Ireland)]	Thank you for your response, which has been considered in the review process but did not receive consensus agreement in the overall special report process. Rejected. Tipping points is a chapter 2 concept and outside of the scope of chapter 7 (after deletion of the tipping points box)
21617	10	2	10	21	The use of the term risk is biased towards a WGII-impacts context. The term risk also has an important place in the WGIII domain, where climate hazards may not be a driver of risk at all (e.g. investment risk, policy risk, risks created by one policy for another domain - BECCS being a key example). Note there is work underway to update the glossary definition of risk to achieve a more inclusive understanding of the policy, investment and governance domains of risk (and risk management), but in either case, this chapter should broaden its use of the term risk such that it applies to the policy domain, not only the intersection of hazard, exposure and vulnerability. [Andy Reisinger, New Zealand]	additional wording added to make this point
21325	10	15	10	17	Not clear what is meant by the 'nature of climate impacts' or how this relates to human actions. Please rephrase, explain and/ or provide reference. [United Kingdom (of Great Britain and Northern Ireland)]	Sentence clarified
21619	10	18	10	18	I don't understand what is meant by risk not being "contrasted" with uncertainty. Risk and uncertainty mean different things, so where is the contrast or lack of contrast? [Andy Reisinger, New Zealand]	Sentence now deleted
10393	10	19	10	21	this is not informative. How are these concepts related to risk? [Jean-Luc Chotte, France]	Rejected: the signposting of links between risk, vulnerability and resilience is sufficiently clear for an introductory sub-section
17939	10	29	10	29	Saluja, N and Singh 2018 is a newspaper report of Economic Times which should be strictly avoided. [Nayanika Singh, India]	sentence deleted

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
28847	10	30	10	30	I am wondering why there is no policy being reported or suggested in this report against the use of shale gas? As we know the exploitation of shale gas is the most destructive process of the fresh water! [Samir Hassani, Algeria]	Rejected. Outside the scope of this report.
10527	10	30	10	32	SDG goal for addressing freshwater ecosystems is found in Goal 6.6 [Jean-Luc Chotte, France]	sentence deleted
21621	10	33	10	33	Note there is a glossary definition of governance (and has been in previous reports). Perhaps express this differently (and check that the glossary definition matches your intended definition?) [Andy Reisinger, New Zealand]	Accepted. Phrase of treatment of governance in previous IPCC reports deleted. The glossary for 1.5 defines governance and our definition is not inconsistent but specific for the content of this chapter.
40845	10		10		climate hazards to be more explicitly treated across chapters (e.g. ch 2, 3, 4, 5, 6) and here. [Valerie Masson-Delmotte, France]	Chapter 7 deals with climate hazards in the first table as well as in relation to policies responding to drought, flood, fire etc. In the risk section reference is made back to the chapters explicitly outlining risk of extreme events (siuch as chapter 2).
3715	10	2		15	add respective subchapter Numbers to better show roadmap [Cordula Ott, Switzerland]	This comment actually refers to page 11, 2-15. The section has been rewritten and sub-chapter numbers added
3719	10	9		13	Grammar? [Cordula Ott, Switzerland]	Copyedit to be completed prior to publication, however, quotes are specific to what was previously written and can't be amended.
3717	10	23			Reconsider title: major risks and drivers (?) or: Risks and local response? not very clear (to me) what this is about [Cordula Ott, Switzerland]	Rejected: we felt the sub-section title was clear in context
25675	11	23	11	23	A subsection could be dedicated to the notion of risk and uncertainty in economics. Some references that could be useful: - Bali, Turan G., and Hao Zhou. "Risk, uncertainty, and expected returns." Journal of Financial and Quantitative Analysis 51.3 (2016): 707-735. - Nordhaus, William D. The climate casino: Risk, uncertainty, and economics for a warming world. Yale University Press, 2013. - Stern, Nicholas. "The economics of climate change." United Kingdom (2006). - Heal, Geoffrey, and Antony Millner. "Reflections: Uncertainty and decision making in climate change economics." Review of Environmental Economics and Policy 8.1 (2014): 120-137. [, France]	Thank you. This suggestion has been taken into consideration in a cross chapter economics box.
10395	11	24	11	35	this is quite confusing. Provide a clear statement of how you are defining drivers. reword this passage. [Jean-Luc Chotte, France]	Thank you. This suggestion has been considered in the revisions.
39953	11	24	11	41	The introduction of Section 7.3.1 reads too academic and not connected to policy or the land sector. The example of a risk assessment of an electric dam seems out of place and not relevant. Why is risk assessment brought up in the introductory section? [, United States of America]	Thank you. This suggestion has been considered in the revisions.
1961	11	24	11	44	Perhaps the authors could reference the work of Spiegelhalter on uncertainty, e.g., Spiegelhalter et al., Visualizing uncertainty about the future, Science, 333, 1393, 2011. [William Lahoz, Norway]	Thank you. This reference has been considered.
21327	11	27	11	30	not clear what is meant by 'drivers or human or natural induced circumstances' and how these are separate from the impacts and consequences of climate change. Consider simplifying the language for example by removing the phrase 'human or natural induced circumstances' and the adding the word 'other' before 'drivers'. [, United Kingdom (of Great Britain and Northern Ireland)]	Thank you. This suggestion has been taken into account in the revisions (language simplification).
28849	11	27	11	30	It is not clear how religious can worsen climate change!! to the best of my knowledge, there is no religion on earth calling to the destruction of the environment!! In addition, the authors in Nelson et al. 2006, did not give a clear explanation about this statement, he confused religion and culture, which are definitively not the same. [Samir Hassani, Algeria]	Thank you. This suggestion has been taken into account in the revisions (passage revised).

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
39951	11	23	14	9	Section 7.3.1 is very general and could be eliminated; alternatively, it should be significantly shortened to focus on the land use and food security elements that are the agreed topic of the report. [United States of America]	Thank you. The section has been condensed.
24801	11	16	21	12	Section 7.3 is about climate related risks for natural and human land systems (what is a human land system, by the way?) If you can, consider rewording the header to climate and land related risks for human well-being... The subsection 7.3.1 should be put somewhere else (describing risk drivers). Take a look at the headers and subheaders and subparts of the subsections to get the right alignment. One idea could be to dismantel 7.3.1 -- cluster "land and climate interactions together" as one subsection and strip out human systems so that that is its own subsection (instead of being clustered with land). In that scenario, put the bit on norms/values/priorities under 7.3.3 (human interactions with land and climate), and then the bit on temporal and spatial scales under climate and land 7.3.2. [Justice Issah Musah Surugu, Germany]	Thank you. This suggestion has been taken into account in the revisions.
1531	11	16	26	24	Subchapter 7.3 should contain some reflections on the risk of temperature overshoot, as climate change risk and/or as a risk arising from climate policy choices, since most of the 1.5C scenarios in IPCC SR1.5 rely on high temperature overshoot (although this is not well represented in the pathways figure in SR1.5), to be brought down by CDR. There's not much literature on this, a good start would be IPCC SR1.5, but also more specifically Ricke et al. 2017 (Sci. Rep. 7, 14743), Geden/Löschel 2017 (Nat. Geosci. 10, 881-882) Lowe/Bernie 2018 (Phil. Trans. R. Soc. A 376: 20170263) [Oliver Geden, Germany]	Thank you. To the degree possible 7.3.3 has taken into account the literature suggested, although overshoot is not necessarily part of the scope of this chapter.
3723	11	1			Title (and then content) not clear: Norms, values, priorities as drivers, as response, as risk? [Cordula Ott, Switzerland]	Accepted. Thank you. This comment has been taken into account in the revisions (section was greatly condensed and this comment was taken into account in the editing process). Title has been changed.
27321	11	15			We did not find a vision for the future? [Germany]	The place holder for a vision was deleted as the author team felt the vision was too policy prescriptive. However, a cross chapter box with chapter 6 on policy portfolios and future pathways has been added.
12305	11	23			This section could also mention the problems associated with attribution of impacts to climate change vs. direct anthropogenic drivers (e.g., unsustainable land management practices). [Hans Poertner and WGII TSU, Germany]	Thank you. This suggestion has been taken into account in the revisions, in particular by considering land degradation and land management practices.
3721	11	24		44	Idea? What is drivers? Does not describe the complexity that is the challenge... revise this subchapter [Cordula Ott, Switzerland]	The reviewer comment is not fully clear, but the authors have revised and addressed complexity in this section.
16525	11	45			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 (UNESCAP 2013; Rasul and Sharma 2014)" UNESCAP (2013) The status of the water-food-energy nexus in Asia and the Pacific. Discussion Paper; Rasul, G. and B. Sharma (2014) Water, food, and energy nexus in South Asia: Implications for adaptation to climate change. Handbook of Climate Change Adapatation 1-18. [Republic of Korea]	Water incorporated.
14789	12	5	12	7	"science is clear" degree of clarity? [Mahmood Riyaz, Maldives]	Thank you. This comment was considered during revisions.
28851	12	5	12	7	I do agree with the statement reported by Inglehart R. 1995, saying that "only when people have achieved a reasonable degree of material security can they assign priority to issues such as the environment". This is the exact case of the current world. The emerging countries are not keen about climate change, but only to achieves the position of western countries in term of wealth. [Samir Hassani, Algeria]	Thank you. The reviewer views were noted.

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10397	12	12	12	12	This applies to misdirected, or poorly implemented collective responses. We need collective responses to effectively address climate change. [Jean-Luc Chotte, France]	Thank you. This suggestion has been considered in the revisions.
1963	12	15	12	15	Strictly speaking, it is Niño. Same elsewhere, where it is Niña. [William Lahoz, Norway]	Thank you. This suggestion has been considered in the revisions (box removed).
24315	12	19	12	20	policy measures are a form of societal adaptation [Urbano Fra.Paleo, Spain]	Thank you. This suggestion has been considered in the revisions (though the reviewer didn't really suggest what should be revised).
10399	12	23	12	25	strangely worded. The objective assessment of risk is based on quantifying two components: the likelihood of a hazardous event (likely to rare) and the magnitude of the consequences (insignificant to catastrophic); the risk is the product of the likelihood and the consequence. [Jean-Luc Chotte, France]	Thank you. This comment about risk was considered in the report-wide discussion about risk definitions. Dealt with in section 7.2.
24317	12	23	12	25	it cannot be objective according to the following statement regarding the subjectivity in the process, including policy makers. [Urbano Fra.Paleo, Spain]	Thank you. This comment was considered during revisions.
5587	12	44	12	44	"spatial and temporal scale" of what? [Sanaz Moghim, Iran]	Thank you. This comment was considered during revisions (scale of impact)
32299	12	44	12	45	the pursuit of specific SDGs regionally, nationally or globally that can trade-off with other [Sofie Linder, Sweden]	Thank you. This comment was considered during revisions.
5589	12	44	12	46	can the author mention one example that SDGs can make risk! SDGs can mitigate risks, any clarification, reference ... [Sanaz Moghim, Iran]	Thank you. This comment was considered during revisions.
32301	12	46	12	46	SDGs or with goals that are not explicitly included in the SDGs. How risks is determined or [Sofie Linder, Sweden]	Thank you. This comment was considered during revisions.
3729	12	39	13	4	This is very unclear... what should be the information to teh reader?.. It somehow sound like a wild combination of ideas... or jsut a question of grammar? Needs reformulation and clarification [Cordula Ott, Switzerland]	Thank you. This comment was considered during revisions.
3737	12	1	14	9	Those subchapters have to be revised carefully... ideas and language ... or even think about deleting them (or most of it), as the following subchapters are much more concise... and some duplication emerges [Cordula Ott, Switzerland]	Thank you. Section fully revamped and revised.
21897	12	2	14	25	7.2 Introduction and Relation to Other Chapter, 7.3.1.1. Norms, Value, Priorities.Please provide more details to address issues of uncertainty [Olusegun Adeaga, Nigeria]	Thank you. This section was actually greatly trimmed back in the revisions.
3725	12	42		44	Such sentences are confusing. And what is land-climate-society hazard... In general, in this subchapter, he complexity at hand is not described well. The text even adds to the complexity/or complicatedness [Cordula Ott, Switzerland]	Thank you. This comment was considered during revisions.
3727	12	44		46	problem of grammar or too complicated? I do not understand [Cordula Ott, Switzerland]	Thank you. This comment was considered during revisions.
31773	13	9	13	9	this is a strange reference to support the statement with as it is based on model systems. Perhaps Urban et al. 2016 Science would be better? [Mike Morecroft, United Kingdom (of Great Britain and Northern Ireland)]	Thank you. The reviewer comment was taken into account during revision.
14791	13	30	13	31	"their impact on physiological and behaviour plasticity, genetic differentiation, and phenotypic plasticity of species" what is mean by this give some examples . [Mahmood Riyaz, Maldives]	thank you. Due to space limitations this sentence was simplified and further examples are not given of plasticity.
28853	13	39	13	40	Could you refer to a real case where climate change could be beneficial to the cultivation in certain areas and the same time causing instability in domestic food production. It will provide more awareness to the policy makers. [Samir Hassani, Algeria]	Thank you. The four elements of food security are considered in 7.3.2 and in 7.4.1
571	13	47	13	47	maladapted population. Human population? Please precision is needed [Nathalie Hilmi, France]	Thank you. The reviewer comment was taken into account during revision.
12307	13	48	13	48	Need to explain 'plasticity benefits'. [Hans Poertner and WGII TSU, Germany]	Thank you. The reviewer comment was taken into account during revision.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
5591	13	48	13	48	better to change "plasticity benefits" [Sanaz Moghim, Iran]	Thank you. The reviewer comment was taken into account during revision.
40847	13		13		framing in slow/fast onset could be introduced in ch 1 in relationship with UNFCCC (eg loss and damage) and risk management. [Valerie Masson-Delmotte, France]	Thank you. This is relevant to chapter 1.
3731	13	5			Risks and drivers across Spatial and temporal Scales??? The whole structure of this chapter is a mystery to me. Please indicate the main idea and also put it in the title [Cordula Ott, Switzerland]	Thank you. The reviewer comment was taken into account during revision.
27323	13	7			"predicted" is not a scientific term, please amend. [, Germany]	Thank you. The reviewer comment was taken into account during revision.
3733	13	17		20	just missing 'and'? Or nonsense? And: 'affect vulnerabilities and outcomes'? [Cordula Ott, Switzerland]	Thank you. The reviewer comment was taken into account during revision.
3735	13	30			plasticity = resilience? [Cordula Ott, Switzerland]	Thank you. No plasticity does not refer to resilience in this case.
12309	14	5	14	5	Do you mean 'adaptive capacity' instead of 'potential'? [Hans Poertner and WGII TSU, Germany]	Thank you. This comment has been taken into account in revisions.
573	14	5	14	5	typo: populationS [Nathalie Hilmi, France]	Thank you. This comment has been taken into account in revisions.
1965	14	5	14	5	population's. [William Lahoz, Norway]	Thank you. This comment has been taken into account in revisions.
14699	14	14	14	17	Drought should be a sub/category, at least under desertification. [, Canada]	Thank you. Drought is mentioned throughout the chapter, and cross references are made to chapters 3 and 4 as well as a cross chapter box on drought.
10401	14	14	14	17	needs rewording: most of these are processes (not components) of desertification and land degradation. Should be "risk associated with" or due to, not "risks to". Desertification is defined as occurring in arid, semi-arid and dry-subhumid climates - otherwise known as drylands. land degradation occurs in all climates. [Jean-Luc Chotte, France]	Thank you. This review comment has been considered in the revisions.
7191	14	18	14	18	It might be helpful if the actual table is referenced instead of generic reference to supplementary tables. [Debra Roberts, South Africa]	Thank you. This comment has been taken into account in revisions.
14793	14	19	14	20	Has there been accuracy assessment or degree of applicability of the "expert Judgement" [Mahmood Riyaz, Maldives]	Thank you. The method is now explained in chapter 7.
21623	14	22	14	25	SR15 says we're now at 1 degree of warming above pre-industrial, how come this says 0.87 degrees? Also please replace the word "likely" with another appropriate term. [Andy Reisinger, New Zealand]	Thank you. The material has now been harmonized with SR1.5
21329	14	23	14	24	This text, as well as figures 7.1 and 7.2 state that 0.87C is a measure of the extent of present day warming / current global average temperature increase. The Special Report on 1.5°C states that this temperature is the observed global mean surface temperature for 2006-2015, which is not the same as present-day warming (2018). Therefore the text and figures should either reflect the true historical nature of that temperature, or all reference should be changed 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)]	Thank you. The material has now been harmonized with SR1.5
10403	14	25	14	25	processes, not sub-components [Jean-Luc Chotte, France]	Thank you. This comment has been taken into account in revisions.

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28855	14	10	15	28	Some readers are not ready to accept any results without knowing the methodology used and source of the implemented data. The Supplementary Material is not complete, and the methods are not clear how did you obtain your data? " I suggested to the authors of this report to include Appendix section resuming all the methodologies used to generate the presented data. It helps other expert to measure the incertitude of your calculation. Some policy makers are surrounded by expert where their opinions are opposite to yours. Therefore, to convince them you need to provide a full evidence. In other words, your risk assessment output should be carefully justified. [Samir Hassani, Algeria]	Thank you. The reviewer comment was taken into account during revision. The supplementary material and methods are now provided.
21331	15	1	15	1	The colours used to represent level of risk in the burning embers diagram 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)]	Thank you. The material has now been harmonized with SR1.5
29703	15	1	15	11	This is a useful figure for showing impacts at different levels of warming, providing valuable continuity with SR1.5 and AR5. It would be helpful to also indicate limits to adaptation on the figure (as done in SR1.5). [, Saint Lucia]	Thank you. The material has now been harmonized with SR1.5
17923	15	1	15	11	This is a very valuable figure as it presents the clear linkages between warming and impacts on land and builds upon SR1.5. However, the figure is not clear in how it deals with different land use patterns / socio-economic assumptions. 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 this figure could specify what socio-economic / LULUC assumptions it is based on. [Quentin Lejeune, Germany]	Thank you for this suggestion. The comments were useful and considered including in SSP related embers and discussion, and some were beyond the available space to analyze LULUCF and land use patterns.
25677	15	2	15	2	The link with the concept of "Reason for concern" (RFC) mobilized in SR15 should be clarified. [, France]	Harmonised with SR1.5.
10405	15	2	15	3	clarify that you mean degrees Celsius, not degrees in the non-technical sense of the term [Jean-Luc Chotte, France]	Noted and revised
39955	15	2	15	11	The basis of Figure 7.1 should be more clearly identified. What is the underlying basis for the expert judgment? Is that elucidated anywhere in the report or in associated documentation? [, United States of America]	Accepted. This has been expanded. Narratives have been added into section 7.3 to further explain the basis of expert judgement.
3465	15	3	15	3	The expression here suggests that the current temperature increase is 0.87°C, a conclusion that is inconsistent with the current warming of 1.0°C as mentioned in the IPCC Special Report on 1.5°C. So it is suggested that a revision be made. [, China]	Thank you. The material has now been harmonized with SR1.5
10407	15	3	15	6	see comment above on same text about "components" and separation of desertification and land degradation. Also, as vegetation changes and soil erosion are shown only once but stated as being specific to both desertification and land degradation, it is not clear whether this is a weighted assessment covering all climates; if retained as separate components for drylands and non-drylands then there should be separate bars for each. Risk of soil erosion appears underestimated. [Jean-Luc Chotte, France]	Thank you. This comment has been taken into account in the revisions, in close consultation with TSU and former embers authors, taking into account the particular focus of SRCL.

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32585	15	14	15	18	<p>The reference is Zhu, not Zhou “C. Zhu et al., "Carbon dioxide (CO2) levels this century will alter the protein, micronutrients, and vitamin content of rice grains with potential health consequences for the poorest rice-dependent countries," Science Advances (2018)". Suggest inclusion and acknowledgement of other references such as Goufo et al 2014, which brought attention to ‘reductions of 9 and 28% were observed for linoleic acid in the brown rice and for γ-linolenic acid in the husk’ and decrease in iron bioavailability in the brown rice (22%), calcium bioavailability increased in the bran and husk (5–11%); and draw attention to variation in response to eCO2 based on genotypes (refer, Dwivedi et al, 2015 for example) to emphasize the importance on biodiversity/agrobiodiversity conservation to address climate challenges.</p> <p>Effect of Elevated Carbon Dioxide Concentration on Rice Quality: Nutritive Value, Color, Milling, Cooking, and Eating Qualities. Piebiep Goufo, Virgilio Falco, Carla Brites, Dulcinea F. Wessel, Sylvia Kratz, Eduardo A. S. Rosa, Corina Carranca, and Henrique Trindad. 2014. Cereal Chemistry. Volume91, Issue5, September/October 2014, Pages 513-521</p> <p>Influence of Rising Atmospheric CO2 Concentrations and Temperature on Morpho-Physiological Traits and Yield of Rice Genotypes in Sub Humid Climate of Eastern India. Sharad Kumar Dwivedi*, Santosh Kumar, Ved Prakash, Surajit Mondal, Janki Sharan Mishra. American Journal of Plant Sciences, 2015, 6, 2339-2349. Published Online September 2015 in SciRes. http://www.scirp.org/journal/ajps http://dx.doi.org/10.4236/ajps.2015.614237 [Neeraja Havaligi, United States of America]</p>	Thank you. Additional references considered in the revisions.
39957	15	18	15	18	The citation to Zhou et al. may be incorrect. The correct lead author is identified as Zhu in the 1.5°C SR. The source should be added to the reference list. [, United States of America]	Thank you for this remark. References have been checked and corrected.
21333	15	18	15	20	The phrase 'Limiting warming to 1.5°C or 2°C lowers risks across all components' is meaningless, unless it is specified what level of warming this is relative to (e.g. would limiting to 2°C lower risks relative to 2.001C?). It would also be helpful to emphasise that there is a benefit to limiting to 1.5C relative to 2C - as it is currently phased, it sounds like there is minimal/no difference between the two levels. [, United Kingdom (of Great Britain and Northern Ireland)]	Noted and taken into account with TSU advice in revisions.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
39959	15	25	15	27	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 1.5°C SR, 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 the 1.5°C SR does not find support for this statement. Rather it shows the following: "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. This suggestion has been taken into account in revisions.
31775	15		15		Fig. 7.1 Fire and permafrost melt are observable now (and probably soil erosion) - this isn't clear from the figure - I thin the yellow should perhaps extend a little further down. [Mike Morecroft, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Figure has been revised. The variables have been corrected.
40851	15		15		I find very hard to understand the establishment of Figure 7.1 and traceability to other chapters (often not providing inputs linked to level of warming), and assessed literature, and to understand how expert judgment was done. Missing livestock heat stress here, and confidence. Any insights from Ch 7 on "regional hotspots" to expand on SR15 for this (table 3.8) for larger levels of warming? [Valerie Masson-Delmotte, France]	Thank you. This comment has been taken into account in the revisions, in close consultation with TSU and former embers authors, taking into account the particular focus of SRCLL. Mammalian heat stress is dealt with in a cross chapter box. Chapter references and a methods explanation have been included in the revisions.
21335	15	29	16	9	A more balanced discussion here of different SSPs (including SSP 4 and 5) would be helpful, as opposed to focussing on SSPs3 and 1. SSP4 and 5 should also be incorporated into Figure 7.2 if possible. [United Kingdom (of Great Britain and Northern Ireland)]	Thank you. For the embers, SSP 1 and 3 have been considered.
17139	15	1	17	1	Improve the graphs (images Quality) [Wesam Madhoun, Malaysia]	Thank you. This suggestion has been taken into account during the revisions process. Graphs image has been improved.
21625	15	1			Figure 7.1: Overall this figure needs a much clearer traceability in the text as to why the risk transitions from undetectable through to very high are placed where they are. There is too much untraceable judgement in the figure as it stands, with a high potential for error. For example, climate change impacts on fire severity/frequency and permafrost degradation are evidenced now, why is this shown as undetectable in the figure? Also why is the nutrition risk becoming high so early - risk is a function of magnitude of impact as well as probability of occurrence, and I'm not aware of sufficient evidence in chapter 5 that says that warming of 1.5 degrees would already lead to significant loss of nutritional value of crops (but that's where the risk goes high in the current figure). Furthermore it's not clear why coastal erosion is listed here as a risk in a report on climate change and land - explanation needed up-front. I'm not convinced that coastal erosion is an adequate indicator of land degradation (chapters 2 and 4 should support this explicitly if this proxy is to be used here - I don't think they do). [Andy Reisinger, New Zealand]	Accepted. The method has been rewritten and added. Coastal erosion is mentioned in chapter 4 as a process relevant to land degradation. Certain land related processes (e.g. subsidence and ground water extraction) contribute to coastal erosion. That is why coastal erosion is included in our review of risks. Additional information about methods has been added as well as detailed narratives to increase traceability for each ember.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
27325	15	1			Risks to nutrition safety rises with rising temperature: an assessment of this information in chapter 7 should be please included in chapter 5 which currently seems to focus on the high risks for food security resulting from high ambition mitigation scenarios. [, Germany]	Noted. Material has been shared with chapter 5 and risk assessment harmonized.
27327	15	27			"at higher temperatures of warming regional differences disappear" - this cannot be true, please reconsider. [, Germany]	Thank you. This suggestion has been taken into account in revisions.
22023	15				Socio-economic developments and policy choices that govern land- Water -climate interactions are an important driver of risk along with climate change (very high confidence). I recommend Water to be added to the equation [Hala Abayazid, Egypt]	Water added, economics cross chapter box added
22025	15				coastal erosion was used as the indicator for land degradation in relation to warming... Would need to include other drivers in evaluation and prediction...hard to exclude source of effect whether related to climate change and/or anthropogenic (development) processes? Either way more implications and factors need to be clarified and be considered, especially in evaluation and potential adaptive measures; (Figure 7.1) [Hala Abayazid, Egypt]	In addition to coastal erosion we consider now additional indicators of land degradation: fire risk, vegetation loss and precipitation extremes (as a driver of soil erosion)"
28857	16	1	16	9	How did you measure the confidence level of SSP1 on limiting desertification? What is the level of certainty of SSP1 pathways in lowering levels of forest loss, and of SSP3 pathways implementation consequence? [Samir Hassani, Algeria]	Thank you. This comment has been taken into account during revisions. The assessment and the text has been revised and remind that the confidence level is estimated (for all embers) based on the amount and quality of available evidence to make the expert judgment. The assessment for desertification under SSP1 and SSP3 now includes new data from Byers et al 2018 indicating water scarcity for drylands under different warming levels and different SSPs
22887	16	1	16	18	This section too much repeats what is discussed in other chapters and has no specific findings relevant to this chapter. It is recommended to revise this section focussed on the policy relevance of what is found in previous chapters rather than simply repeating the analysis done in previous chapters [Anastasios Kentarchos, Belgium]	Thank you. These suggestions have been taken into account in the revisions.
10381	16	1	16	18	This section too much repeats what is discussed in other chapters and has no specific findings relevant to this chapter. It is recommended to revise this section focussed on the policy relevance of what is found in previous chapters rather than simply repeating the analysis done in previous chapters [Jean-Luc Chotte, France]	Thank you. These suggestions have been taken into account in the revisions.
25679	16	10	16	11	The signification of GMT should be recalled. [, France]	Thank you. These suggestions have been taken into account in the revisions.
1967	16	11	16	11	I suggest the authors introduce the acronym for GMT. [William Lahoz, Norway]	Thank you. These suggestions have been taken into account in the revisions.
1325	16	13	16	15	The important role of food trade could be more elaborated in this chapter [Oswaldo Lucon, Brazil]	Thank you. These suggestions have been taken into account in the revisions.
21337	16	19	16	19	It is misleading to use a single indicator as a proxy for land degradation or food insecurity. Thus the headings in part A of Figure 7.2 would be better labelled 'Coastal erosion' and 'Food price rise' to remove any impression that the risks shown relate to land degradation / food insecurity overall. [, United Kingdom (of Great Britain and Northern Ireland)]	Thank you. The embers diagrams have been revised in close consultation with all chapters and TSU.
39961	16	24	16	24	It is inappropriately prescriptive to say that the mitigation effort is "required." This also appears to gloss over what might seem to be potentially important differences in mitigation pathways. [, United States of America]	Thank you. This suggestion has been taken into account in the revisions.
39963	16	26	16	26	The supplementary table does not appear to have been provided. [, United States of America]	Thank you. This suggestion has been taken into account in the revisions.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
10409	16	27	16	27	strange choice: coastal erosion is not one of the more significant aspects of land degradation likely to have major consequences in terms of land area affected, food production, ecosystem services. [Jean-Luc Chotte, France]	Thank you. This suggestion has been taken into account in the revisions.
32303	16	27	16	27	Coastal erosion was used as the indicator [Sofie Linder, Sweden]	Noted.
5593	16	34	16	34	can we this "Climate change reduces the functionality, stability, and adaptability of ecosystems", we know increase in CO2 can enhance photosynthesis, climate change has impacts on boreal forest and ... [Sanaz Moghim, Iran]	Noted.
40853	16		16		Fig 7.2 is also hard to understand in detail, especially panel B. How has it been exactly established? Why? [Valerie Masson-Delmotte, France]	Thank you. The figures have been substantially revised and refined.
21627	16	20			Do chapters 5 and 6 support this assessment of risks? The figure would be much stronger (and have a greater chance of being used in the SPM) if there could be line of sight provided back to those to chapters. I don't feel the text in this chapter provides enough traceable evidence to support the judgements made in this figure (powerful as it could be). It don't disagree with the intent, but such a figure needs much clearer, explicit and multiple lines of evidence to support the judgements that have to be made about where to place the risk transitions. [Andy Reisinger, New Zealand]	Thank you. The embers diagrams have been revised in close consultation with all chapters and TSU.
22027	16				Figure 7.2: coastal erosion was used as the indicator for land degradation in relation to warming... Would need to include other drivers in evaluation and prediction...hard to exclude source of effect whether related to climate change and/or anthropogenic (development) processes? Either way more implications and factors need to be clarified and be considered, especially in evaluation and potential adaptive measures [Hala Abayazid, Egypt]	Thank you. These suggestions have been taken into account in the embers discussion in 7.3.2.
22889	17	1	17	27	Consistency with what is reported in other chapters must be checked and this must be revised to avoid repetition of what has been analysed in more detail in other chapters and what has been assessed through IPBES (esp regional assessments that are available) [Anastasios Kentarchos, Belgium]	Thank you. The chapter material has been revised in close consultation with all chapters and TSU, some of whom were IPBES authors.
10383	17	1	17	27	Consistency with what is reported in other chapters must be checked and this must be revised to avoid repetition of what has been analysed in more detail in other chapters and what has been assessed through IPBES (esp regional assessments that are available) [Jean-Luc Chotte, France]	Thank you. The chapter material has been revised in close consultation with all chapters and TSU, some of whom were IPBES authors.
5595	17	2	17	3	what it mean and how it is possible, at least a reference! "extreme changes in precipitation can reduce [Sanaz Moghim, Iran]	Thank you. This suggestion has been taken into account in the revisions.
5597	17	5	17	5	"impacting diverse ecosystem services including impacting aesthetic and cultural services" needs to be rewritten. [Sanaz Moghim, Iran]	Thank you. This suggestion has been taken into account in the revisions.
12311	17	6	17	8	Such a "likely" statement should be based on more recent evidence than MEA 2005, e.g., on the evidence that follows. However, the phrasing here is confusing. [Hans Poertner and WGII TSU, Germany]	Thank you. This suggestion has been taken into account in the revisions.
14795	17	12	17	18	Since there is little evidence that biodiversity extinction can be linked with CC how can you say that 10% of species are increasingly high risk of extinction for every 1°C rise? This is confusing and contradicting [Mahmood Riyaz, Maldives]	Thank you. The chapter material derives from peer reviewed literature and previous assessments including SR1.5
39965	17	18	17	20	One wonders if the statement here might be a bit dated, given the age of the source. [United States of America]	Thank you. This suggestion has been taken into account in the revisions.
39967	17	23	17	27	The syntax here is garbled. [United States of America]	Copyedit to be completed prior to publication.
39969	17	28	17	28	The title of 7.3.2.3 refers to nutrition, but nutrition is not addressed in this section (it is briefly raised in 7.3.2.1). It would be desirable to build out a discussion on nutrition, which is important for food security, in a separate section. [United States of America]	Thank you. This suggestion has been taken into account in the revisions under food utilization in 7.3.2.

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32587	17	29	17	34	Some studies quiet a few studies that shine light on the economic implications of climate change, such as: Climate change and human health: Impacts, vulnerability and public health. A.Haines, R.S.Kovats, D.Campbell-Lendrum, C.Corvalan. Public Health, Volume 120, Issue 7, July 2006, Pages 585-596 Economy-wide estimates of the implications of climate change: Human health. FrancescoBoselloa, Roberto Roson, Richard S.J.Tol. Ecological Economics. Volume 58, Issue 3, 25 June 2006, Pages 579-591 [Neeraja Havaligi, United States of America]	Thank you. This suggestion has been taken into account in the revisions.
21703	17	29	17	35	The discussion of health in general makes no mention of different helthcare capacities between zones and social classes or groupings. E.g. the malaria rates on either side of the US/ Mexico border are different, but not because of physical environment factors. [Timothy Forsyth, United Kingdom (of Great Britain and Northern Ireland)]	Thank you. This suggestion has been taken into account in the revisions to some extent and within the boundaries of the assessment mandate for SRCL.
575	17	35	17	35	maybe low temperatures too? [Nathalie Hilmi, France]	Thank you. This suggestion has been taken into account in the revisions.
21341	17	35	17	46	It is unclear what emission pathway or temperature these 2050 mortality figures correspond to. This should be specified [, United Kingdom (of Great Britain and Northern Ireland)]	Thank you. This suggestion has been taken into account in the revisions.
40855	17		17		The paragraph linking climate change and biodiversity is weak with little references assessed. Is this in the remit of this report? Links with other assessment reports? [Valerie Masson-Delmotte, France]	Thank you. This suggestion has been taken into account in the revisions and linked to embers discussion and what is at stake for humans and ecosystems.
23595	17	28	20	2	Chapter 7 should include atmospheric pollution related risk. Climate change exacerbates air pollution with increase UV and ozone concentration. It has negative impacts on human health and increase mortality rate especially in urban region. Anenberg et al. (2010) described the mortality increase from air pollution with climate change. Anenberg, S.C., Horowitz, L.W., Tong, D.Q., West, J.J., 2010.An estimate of the global burden of anthropogenic ozone and fine particulate matter on premature human mortality using atmospheric modeling. Environ. Health Perspect, 118, 1189?95. [, Republic of Korea]	Thank you. This suggestion has been taken into account in the revisions.
21339	17	28	20	2	This section contains a very nice discussion on the effect of land use of the health implications of heatwaves. It would be helpful to have a similar indication of the effect of land use on the health implications of air pollution, given the huge number of premature deaths caused by poor air quality [, United Kingdom (of Great Britain and Northern Ireland)]	Thank you. This suggestion has been taken into account in the revisions.
29855	17	29	20	2	In this section meant for risks to health and nutrition, there is nothing to indicate that the issue of nutrition has been discussed. Impact of climate change on nutrition is an issue and has to be dealt with elaborately. [Souparna Lahiri, India]	Thank you. Nutrition is discussed under food utilization in section 7.3.2.
12313	17	28			Update this section based on Watts, N. et al., 2018: The 2018 report of the Lancet Countdown on health and climate change: shaping the health of nations for centuries to come. The Lancet, doi:10.1016/S0140-6736(18)32594-7. [Hans Poertner and WGII TSU, Germany]	Thank you. This suggestion has been taken into account in the revisions.
12315	17	47			Put case study in a box, to clearly indicate where it begins and ends. [Hans Poertner and WGII TSU, Germany]	Thank you. This suggestion has been taken into account in the revisions.
24319	18	1	18	2	or farming areas. Instead of paved man-made built areas, it would be more appropriate impervious built areas [Urbano Fra.Paleo, Spain]	Thank you. This suggestion has been taken into account in the revisions. Cross chapter box.
39971	18	1	18	5	No source is cited to support this statement. [, United States of America]	Thank you. This suggestion has been taken into account in the revisions. Cross chapter box.

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24321	18	4	18	4	and increased runoff Miller JD, Hess T, Urbanisation impacts on storm runoff along a rural-urban gradient, Journal of Hydrology, Vol. 552, September 2017, pp. 474-489. [Urbano Fra.Paleo, Spain]	Thank you. This suggestion has been taken into account in the revisions. Cross chapter box.
17141	18	5	18	7	Mha stanad for what? [Wesam Madhoun, Malaysia]	Thank you. This suggestion has been taken into account in the revisions. Accepted
24323	18	6	18	6	per surface unit [Urbano Fra.Paleo, Spain]	Thank you. This suggestion has been taken into account in the revisions. Accepted
16899	18	8	18	8	The land-based mitigation options concentrate on forest as land use. Should one not include other land-based mitigating options on arable land, grassland and specifically also wetland restoration? [Roland Hiederer, Italy]	Thank you. This suggestion has been taken into account in the revisions. Accepted
1969	18	22	18	22	increases -> increase. [William Lahoz, Norway]	Copyedit to be completed prior to publication.
577	18	24	18	25	Maybe a reference would be needed here? [Nathalie Hilmi, France]	Thank you. This suggestion has been taken into account in the revisions. Cross chapter box.
14797	18	43	18	44	Why is climate change induced malaria death is going down from 2030 to 2050? This is under which scenario? [Mahmood Riyaz, Maldives]	Thank you. This suggestion has been taken into account in the revisions. Cross chapter box.
40857	18		18		lots of repetitions with other chapters on urban areas, to integrate (in a x chapter box?). [Valerie Masson-Delmotte, France]	Thank you. This suggestion has been taken into account in the revisions. Accepted
21343	18	43	19	12	It is unclear what emission pathway or temperature these WHO figures correspond to. This should be specified [, United Kingdom (of Great Britain and Northern Ireland)]	Thank you. This suggestion has been taken into account in the revisions. Cross chapter box.
28691	18	1		48	Urban development involves the removal of natural areas such as forested and water surface with paved man-made built areas. I recommend an Urban heat mitigating process with impacts on Land,air and water. Implementation of Air quality, water quality and land impacts effects(Positively). Integrated Air quality and management system, Air and temperature control system, weather patterns analysis, carbon sink process, carbon sequestration, concrete carbon mitigating process in the use of Urban development, concrete carbon. Forest removal,carbon loss and high emission. I recommend an implementation of forest parks for every 10km of building construction. Urban development can also leads to an increase in waste burning. Waste burning is very and extremely dangerous in relation to air pollution, causing breathing very difficult and increase in health hazards. Breaking down of different chemical compositions of multiple chemical materials through waste burning could change the weather patterns and increase in temperature,modified climatic parameters. An integrated combating system must be implemented in relation to Urban Waste burning [Abiodun Adegoke, Nigeria]	Thank you. This suggestion has been taken into account in the revisions. Cross chapter box.
28693	18	30		48	Increase in extreme temperature due to Urban expansion leads to increase in various kind of diseases every year which are parts of the effects of climate change. Deaths tolls through water contamination, air pollution, and heatwave is increasing day by day due to temperature extreme. An integrated combat system in relation to disease control should be implemented a cross various geographical regions E.g(Africa). [Abiodun Adegoke, Nigeria]	Thank you. This suggestion has been taken into account in the revisions. Cross chapter box.
14799	19	7	19	8	substantial net increase in the population exposed to the four dominant malaria vectors in the years 2030 and 2050. but the death decrease from 2030 and 2050?? This desent make sense. [Mahmood Riyaz, Maldives]	Thank you. This suggestion has been taken into account in the revisions. Accepted
39973	19	13	19	18	Sources should be cited to support these statements. [, United States of America]	Thank you. This suggestion has been taken into account in the revisions. Accepted
579	19	16	19	18	relation to climate change not clear [Nathalie Hilmi, France]	Thank you. This suggestion has been taken into account in the revisions. Accepted

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
581	19	23	19	23	suspected means "not sure" [Nathalie Hilmi, France]	Thank you. This suggestion has been taken into account in the revisions. Accepted
5599	19	23	19	27	this part needs reference [Sanaz Moghim, Iran]	Thank you. This suggestion has been taken into account in the revisions. Accepted
39975	19	36	19	43	Sources should be cited to support these statements. [, United States of America]	Thank you. This suggestion has been taken into account in the revisions. Accepted
583	19	36	20	2	knowledge gaps [Nathalie Hilmi, France]	Thank you. This suggestion has been taken into account in the revisions. Accepted
17143	20	1	20	7	Improve the graph (image Quality) [Wesam Madhoun, Malaysia]	Thank you. This suggestion has been taken into account in the revisions. Accepted
25681	20	3	20	3	Some elements could be added about forest fires, including a reference to cross-chapter Box 3 about fires and climate change. [, France]	Accepted
22891	20	3	20	9	This very short section nicely avoids repeating what has been said in previous chapters but makes an appropriate reference to the previous chapter. This should have been done also with the other risk types rather than providing a stand-alone analysis. [Anastasios Kentarchos, Belgium]	Thank you. Noted.
23597	20	3	20	9	Risk from extreme events should cover more risks. This is too short. Land degradation generally results in water problem. However, land-water interaction is not address in this report. Chapter 7 may address this as one of land-climate risks. It is recommended to add climate-water related issue here. [, Republic of Korea]	Thank you. This comment has been considered during revisions.
29707	20	3	20	9	This section on risks from extreme events seems incomplete. It should reference SR1.5, and should include increased tropical cyclone intensity, which has implications for coastal erosion, salinisation and crop and infrastructure damage. [, Saint Lucia]	Thank you. This comment has been considered during revisions.
10385	20	3	20	9	This very short section nicely avoids repeating what has been said in previous chapters but makes an appropriate reference to the previous chapter. This should have been done also with the other risk types rather than providing a stand-alone analysis. [Jean-Luc Chotte, France]	Thank you. Noted
14801	20	4	20	9	This para needs to be expanded to include more examples and information [Mahmood Riyaz, Maldives]	Noted. Section has been deleted.
39977	20	11	20	12	It will be important for governments to have the opportunity to review the text once it is inserted here. [, United States of America]	accepted. Text has been included
25683	20	13	20	13	Without calling into question the policy-relevance and adequacy of the elements presented here, it would nevertheless be useful to specify that the risks described correspond to a poor implementation, to use the wording used in section D.4.3 of SR15. Elements should also be included on other land-based solutions, such as natural climate solutions (Griscom et al. 2017), or nature-based solutions, such as agroecology, including agroforestry on agricultural soils and increasing organic matter in the soil, which are strategies to increase the resilience of the socio-ecological systems concerned, and to reduce risks. [, France]	Taken into account. We now provide in the introductory paragraph a justification as to why the section focuses on bioenergy and BECCS rather than discussing all forms of land-based mitigation (i.e. this is the most prominent form of land-based mitigation -together with re/af-forestation- in 1.5 and 2 degrees mitigation scenarios and chapter 6 identifies it as the mitigation option presenting the highest potential for trade-offs- therefore the option for which the risk analysis is most critical).
25685	20	25	20	25	We suggest that the significance of climate change impacts on the feasibility of land-based CDRs be better defined. It is important to explain that the effectiveness of land-based CDRs depends on accounting for the emission trajectory with a scenario at 2°C or even 1.5°C, and therefore on drastically reducing emissions in other sectors. See GENERAL COMMENT ON CDR AND SUSTAINABILITY. [, France]	taken into account. We fully agree and this point was further emphasized

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
27329	20	25	20	32	The remainder of the report does not refer to "effectiveness" but to the "potential" of land-based mitigation, please revise. In addition, the one sentence "Using a set of dynamical global vegetation models (Krause et al. 2018) found that the potential cumulative carbon uptake by year 2099 from combined re/afforestation and BECCS ranges between 19 and 130 GtC, typically lower than assumed in IAMs." does not reflect the full assessment of the BECCS potential presented in this report. Please provide references to the other chapters where this issue is addressed. [, Germany]	taken into account. we now use "potential" and we refer to the relevant chapters where these potentials are discussed rather than reassessing it here
29705	20	25	20	32	This is an important point. It would be helpful to better understand why there are differences between model outputs (as found by Krause et al. 2018). It would also be helpful to add the ranges for BECCS and A/R from IAMs for 1.5 low and no overshoot pathways, to provide an easy point of comparison. [, Saint Lucia]	taken into account. This is now discussed in chapter 6 and we refer directly to the conclusion in this section
17925	20	26	20	28	Klaue et al 2018 provide some explanation for why the DGVMs provide differing results to IAMs - it would be useful to include some further explanation in this paragraph. [Quentin Lejeune, Germany]	Noted. The sentence has been removed, the paragraph now refers directly to the relevant chapters where mitigation potential is assessed
10411	20	31	20	31	does conditions mean vegetation, land use? Please clarify [Jean-Luc Chotte, France]	Noted. Sentence removed
27331	20	33	20	38	Please provide more detailed information on the permanence of storing carbon with CCS technologies. "carbon in fossil fuel reserves is more safely stored than carbon within the biosphere": Does this mean that fossil fuel reserves remain in the ground, or does it mean that CCS is a more permanent storing option than e.g. planting trees? What is meant with "human time scales"? [, Germany]	taken into account. This has been clarified
17927	20	43	20	46	It would be good to mention that the theoretical permanence of geological storage is much higher than biological storage [Quentin Lejeune, Germany]	accepted and added
1527	20	13	21	9	This section could be further strengthened by a more systematical exploration of the various risks of relying on (land-based) CDR, by applying the factors explored by Dooley/Kartha 2018 (Int. Env. Agreements 18, 79-98) and Larkin et al. 2018 (Clim. Policy 18, 690-714). There's not much literature yet on how to plan deployment of CDR in a more limited way (e.g., only to achieve and maintain net zero emissions while prioritizing decarbonization), see Geden et al. 2018 (Clim. Policy 18, doi: 10.1080/14693062.2018.1536600) [Oliver Geden, Germany]	taken into account. references included, thank you.
29857	20	13	21	12	This issue has been dealt with in the IPCC 1.5 report and the expectation was to further concretise with more evidence and references the role and risk, impact and role of land based mitigation models and come out with concrete recommendations. Instead the same has been again mentioned in this report and with the same vagueness involving bioenergy, BECCS etc. IPCC has to take a stand based on scientific evidence and studies on the models of land based mitigation and not pass the buck by mentioning the risks only. [Souparna Lahiri, India]	Taken into account. This section has been revised to make a clearer link with the burning embers figure. This figure provides quantitative information about the level of risk associated with different scales of bioenergy/BECCS deployment. We therefore think that this goes beyond mentioning the risks and gives concrete evidence on how much bioenergy/BECCS is possible within sustainable limits.
28695	20	3		9	Temperature and heat extreme has been the most prominent problems of many nations, this cross all regions pf the world.Heatwave is as a result of extreme weather events occurring every year in India. For the past 10 years statistics show extreme and excessive hot weather has been the problems in various region most especially in oceanic climate. I recommend an integrated climate models to building models to combat heat extreme in India.(Producing example time series of future weather. [Abiodun Adegoke, Nigeria]	Thank you. This suggestion has been taken into account in the revisions. Cross chapter box.

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21629	20	13			Section 7.3.3.2 seems to be focused on discussing the risks associated with land-based mitigation - but where is the discussion of the risks of NOT mitigating land-based emissions? I don't mean risks in terms of climate change impacts, but risks to carbon prices necessary to achieve specified temperature goals in the Paris Agreement, risks to uneven burden sharing across sectors etc. Risk is not a one-way street. [Andy Reisinger, New Zealand]	Thank you. This suggestion has been taken into account in the revisions. Accepted
39979	21	1	21	9	The topic of adverse effects and competition for land resources is potentially a very important one for this report. Yet it gets only a few lines of coverage here; much less than many general topics that are not specific to the topic of the report. This section of the report should be substantially enhanced. [, United States of America]	accepted. We have expanded this section now including a discussion of the burning embers figure providing a risk assessment as a function of bioenergy deployment.
12317	21	1	21	9	A confidence level also for this important risk would be helpful. [Hans Poertner and WGII TSU, Germany]	accepted and added
17929	21	1	21	9	Rather than just citing Anderson and Peters here, could the authors take numbers from 1.5 pathways in SR1.5 for the amount of land required for BECCS and A/R? This would provide a more complete picture. There are also some potential positive impacts of bioenergy that could be mentioned, and the different types of bioenergy (2nd gen bioenergy on abandoned land or degraded land, bioenergy from crop and forest residues) could be described. Can anything be said about algal bioenergy production? [Quentin Lejeune, Germany]	taken into account. We now mention the possible co-benefits by referencing the Cross-Chapter Box addressing this point. Concerning land requirement, this information is given in chapter 2, while we provide a risk assessment as a function of bioenergy deployment. Algal bioenergy is now mentioned in chapter 6.
28859	21	2	21	2	Add refernce [Samir Hassani, Algeria]	accepted. References have been added
27333	21	10	21	12	Please mention that not only the burden for the land sector is transferred to future generations, but more importantly the burden of the impacts of unabated climate change. [, Germany]	accepted. The sentence has been reformulated
29709	21	10	21	12	This point about moral hazard should be contextualised with the findings of SR1.5. While there once could have been a perceived threat of moral hazard, the SR1.5 is clear that all pathways for 1.5 require some amount of CDR, and that action in all sectors is also required. There is no "either or". [, Saint Lucia]	taken into account. There is no either or, but the SR1.5 report highlights different pathways which vary greatly in terms of CDR reliance. The moral hazard therefore still exists due to the possible temptation to rely on more rather than less CDR.
39981	21	10	21	12	The sentence appears a bit biased; it would be better to say a "motivation" than a "pretext." [, United States of America]	accepted. Reformulated
1529	21	10	21	12	This section could be expanded regarding the related concepts of (intergenerational) 'moral hazard' (maybe based on Shue 2018 , in Phil. Trans. R. Soc. A 376: 20170105) and 'mitigation deterrence' (based on Markusson et al. 2018, in Glob. Sust. 1, e10). It could also include reflections on research ethics, based on the already referenced Anderson/Peters 2016 paper and Geden 2015 (in Nature 521, 27-28) [Oliver Geden, Germany]	taken into account. We have added some of these references, thank you.
40859	21		21		what is the exact assessment of multi bread basket failure and assessment of relevant literature and confidence? [Valerie Masson-Delmotte, France]	Noted. Multi bread basket failure has been deleted.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
39983	22	2	22	1	This table seems to represent an arbitrary and incomplete list of potential interactions between land, climate, and society. Some further thought should be given to ensure the list is comprehensive. For example, it ought to include: implications of carbon storage, the use of land for renewable energy generation (e.g., through wind or solar), increasing incidences of wildfires at the wildland-urban interface, implications of bioenergy scale-up for forest conservation and food production, temporary or permanent population shifts due to extreme weather events or shifting climate conditions, interactions between climate and growing urbanization. It would be helpful also to have some more narrative discussion of these issues; a table can be a useful presentational device but it's not a good substitute for explication. Finally, care should be taken to ensure that a list of "indicative policy responses" (the penultimate column) is not prescriptive. [, United States of America]	Use of land for renewable energy is covered under climate change mitigation. Have added a few more. The use of bioenergy and scale up for forest conservation and food production has been explicitly stated. The examples in the main text draw upon the pillar chapters and a few others as suggested will be in the extension table in the appendix. Prescriptive language issue in policy responses has been addressed.
23599	22	1	25	1	Table 7.1. Air pollution (Yellow dust and PM2.5 problem etc) rising from land degradation should be introduced as one of climate-land-society risks. There are diverse issues with land-climate change. Urban issue is one of them. However, this report does not address that issue enough. Urban issue should be addressed as one of risk. [, Republic of Korea]	Done. Added in extended Table in appendix. Have to depend on pillar chapters for most examples.
30521	22		25		add cultural heritage (tangible and intangible) to vulnerability in all sections. [Hannah Fluck, United Kingdom (of Great Britain and Northern Ireland)]	Added
25687	22	1			In table 7,1, sustainable forest management, including adaptation silviculture, should be indicated in the policy response that could prevent or mitigate forest diebacks. [, France]	This is a response option and not a policy response. But have included a policy response for fostering adaptation silviculture with a citation.
17145	23	1	23	7	Improve the graph (image Quality) [Wesam Madhoun, Malaysia]	Accepted. Figures have been revised and improved.
29711	23				Small islands are also exposed to ground water depletion (or at least fresh, non salinised ground water depletion) [, Saint Lucia]	Added and resolved.
1019	24	0	24	0	In the table, the exposure for land degradation and desertification is global. Arid, semi-arid and sub-humid areas cover only desertification, while land degradation is global. [Alisher Mirzabaev, Germany]	The land degradation chapter in our report is restricted to semi-arid and sub-humid regions only, so we have to draw upon the context of our report.
28457	24	1	24	1	Land degradation, as defined in this report, is a global problem impacting ALL lands. Table 7.1 categorizes land degradation AND desertification to be limited to "Arid, Semi-arid and subhumid regions". Chapter 3 does suggest that desertification is essentially land degradation in drylands. But nowhere else in the entire report is land degradation limited. This is a very serious problem because this the words of scientists categorizing land degradation in this way lead to policy decisions (or lack of decisions) which exploit this error. [Barron Joseph Orr, Germany]	We agree but the land degradation chapter in our report is largely restricted to semi-arid and sub-humid regions only, so we have to draw upon the context of our report.
17147	24	16	24	17	check the statement [Wesam Madhoun, Malaysia]	Revised
28861	24	20	24	20	What is the suggested policy response to land desertification in table 7.1? [Samir Hassani, Algeria]	Added policy responses drawn from the desertification chapter 3.
10413	24		24		3rd row: If this is just about drylands, then the hazard should be stated as desertification, not land degradation and desertification. [Jean-Luc Chotte, France]	Have changed the order. The report's land degradation chapter is focused on
25689	24	0			In table 7,1, the case of agricultural soils could be highlighted, leading to include farmers in the column "vulnerability", food insecurity in the column "risk", and "improvement of agricultural practices sustainability" and "revegetation" in the column "policy responses". [, France]	Include in the revised table

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
39985	25	1	25	1	The reference to "stranded assets" is quite vague and the link to the scope of SRCL is a bit unclear. Suggest breaking up this point into more specific issues. [, United States of America]	Have made stranded assets restricted to impact of renewable energy on fossil fuel power plants, oil based economies and loss of infrastructure due to sea level rise
17149	25	3	25	4	check the statement [Wesam Madhoun, Malaysia]	Resolved.
28863	25	8	25	8	I suggest to add Tax cuts as policy response to stranded assets, Table 7.1. [Samir Hassani, Algeria]	Added.
11615	25		25		Stranded assets/Divestment of economies based on fossil fuels may present a major barrier to the necessary changes required to address climate change. The only references to this in Chapter 7 are from bullet points made by Ansar (2013) & Farfan, J., and C. Breyer (2017) in Table 7.1.pg25. No rational to suport this. Reduction in fossil fuel production and usage will impact in countries where plastic production is a downstream fossil fuel activity and a key economic activity that for example contributes 40-45% of GDP in the six oil producing GCC countries (GPCA 2014). This will be further exacerbated by current plastic bans being introduced by many global governments to address marine waste issues. Without these major fossil producer counres onside (and also US, UK, Canada, Australia, Russia, Iraq, Iran...), and significantly reducing and setting target dates to cease production, the fate of the planet is pretty much set towards irreversible climate change. The UN needs to establish economic mechanisms with the World Bank to ensure that fossil fuel producer dependant economies can effectively transition though diversification to a sustainable economic model assuring achievement of the timescales for global climate temperature rise stabilisation targets. Without this the Middle East for example could be come an even worse cauldron of conflict from the collapse of an oil dependant economy. Renwick (2018) describes the significant detrmntal human cost and economic impacts on Venezuela, a major oil prodcuer country brought to its knees from the oil price collapse, corruption and sanctions. [Paul Dumble, United Kingdom (of Great Britain and Northern Ireland)]	Have added in the middle east regions as particularly vulnerable and cited relevant literature
23535	25	11			In the multi-level response study of risk, the current challenge is to integrate ecological restoration and biodiversity issues into top-down national emission reduction policy formulation and implementation, and bottom-up farmers' sustainable livelihoods, so they can be combined Further analysis of the SDG target. [Huai Jianjun, China]	Agreed. Have revised text accordingly
5601	26	2	26	4	this part needs to be re-written and it is not clear what it means "not one optimal and most likely future"! [Sanaz Moghim, Iran]	Noted. Section has been deleted.
17151	26	13	26	15	check the statement [Wesam Madhoun, Malaysia]	Noted. Section has been deleted.
17931	26	18	26	20	Perhaps link to chapter 2.7.3.1 [Quentin Lejeune, Germany]	Noted. Section has been deleted.
21345	26	18	26	21	The phrase 'achieve 3C global average temperature change' makes it sound as if NDCs aspire to a higher temperature goal - this could be rephrased as 'limit global warming to 3C' [, United Kingdom (of Great Britain and Northern Ireland)]	Noted. Section has been deleted.
21347	26	18	26	21	It could be helpful to unpack and explain the uncertainty in NDCs here - there is uncertainty in whether countries will achieve them or not, there is uncertainty in whether conditionalities within the NDCs will be achieved or not, and there is uncertainty in what trajectory they lead to post-2030. [, United Kingdom (of Great Britain and Northern Ireland)]	Noted. Section has been deleted.
30523	26	26	26	42	reference needed to cultural heritage as contributing to human wellbeing. [Hannah Fluck, United Kingdom (of Great Britain and Northern Ireland)]	Noted. Risk deinition in glossary references context. Heritage and human wellbeing arguable implicit in glossary definition.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
10415	26	29	26	30	Is key risk a specific risk category? You have defined substantive and emergent (not emerging) risk but not the other categories (if that is what they are). You have defined substantive, strategic and institutional uncertainty. But it is not clear whether these definitions are intended to apply also to categories of risk. [Jean-Luc Chotte, France]	Accepted. Figure is revised and appears in 7.6.6. explanation revised.
21349	26	31	26	32	The way the dimensions of figure 7.3 are described is potentially confusing. The x and y axes of the figure are currently described as the y and z axes in the text, with the x axis relating to the size of the point. It would be better if agreement (not disagreement, as currently used, which is the opposite of the axis title) was described as the x axis, uncertainty was described as the y axis, and scale as the z axis. [, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Figure has been revised and improved. See 7.6.6
1971	26	31	26	32	The sum of three numbers implies linearity, i.e., independence of the elements forming the three axes, x, y and z. If this is correct, could the authors provide evidence? [William Lahoz, Norway]	Accepted. Figure has been revised and improved. See 7.6.6
5603	26	32	26	32	"uncertainty in knowledge", it is good to mention all factors that can cause uncertainties including lack of knowledge, complexity of the system, parameterization, assumptions, approximations, and simplification that are used [Sanaz Moghim, Iran]	Accepted. Figure has been revised and improved. See 7.6.6
32305	26	39	26	39	There is no explicit SDG goal for fresh water ecosystems and their [Sofie Linder, Sweden]	Copyedit to be completed prior to publication.
10417	26	1	27	42	Fig 7.3: How is the z-axis (level of uncertainty on scale 1-3) shown? Do you mean low/high disagreement, in the parentheses on line 34, respectively? line 36 says the numbers in the "bubbles" indicate trade-offs, while line 41-42 says the numbers indicate references and in the table it says numbers indicate hazards. Line 35 refers to grey scale intensity but this is not discernible in the figure. [Jean-Luc Chotte, France]	Accepted. Figure has been revised and improved. See 7.6.6
24803	26	26	27	47	The case study about "how green is India" doesn't flow well with the substance of Section 7.4. It may belong in a different location. Section 7.4 is about consequences of climate-land change for human well-being and sustainable development. The case study is about "green growth" and could be an example of policy responses in 7.5 [Justice Issah Musah Surugu, Germany]	Accepted. Case study revised and moved to 7.6.6
39987	26	28	27	3	Figure 7.3 is poorly explained in the accompanying text, and the legend of the figure does not seem to match well with the contents of Table 7.1. The references to axes and to "three additional goals" don't seem to match the contents of the figure itself. This should be carefully reviewed, and revised or deleted. [, United States of America]	Accepted. Figure is revised and appears in 7.6.6. explanation revised.
27337	26	28	27	4	We are sorry, but we are not able to follow the description or to understand the figure. E.g. there are only two axes but line 26-31 mentions three, the text states that the size of the bubble is proportional to the level of risk which is not consistent with the figure's legend. Please improve. [, Germany]	Accepted. Figure is revised and appears in 7.6.6. explanation revised.
27335	26	19			"about 3°C" - please be accurate. [, Germany]	Noted. Section has been deleted.
12319	26	26			The logic of this section is not clear yet. First of all, the term 'consequences' is somewhat blurry. It sounds like risks or impacts, which however, have been already addressed. Then, the section starts with a case study, and it is not clear why it is a case study in this section, and it is not clearly explained how it is an appropriate example addressing human wellbeing and sustainable development. Apart from Figure 7.3, the rest of Section 7.4 focuses on selected aspects of wellbeing and development. Also the placement of the other two boxes within subsection 7.4.1.2 is confusing. [Hans Poertner and WGII TSU, Germany]	Accepted. Section has been rewritten. Case studies changed.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
7193	27	1	27	1	The text in the table is barely legible. [Debra Roberts, South Africa]	Copyedit to be completed prior to publication.
21351	27	1	27	1	It would be more intuitive to use Certainty, as opposed to uncertainty as the y axis in figure 7.3, thus making the y=x line similar levels of agreement and certainty. [, United Kingdom (of Great Britain and Northern Ireland)]	Copyedit to be completed prior to publication.
28865	27	1	27	1	The table in figure 7.3 is not readable [Samir Hassani, Algeria]	Copyedit to be completed prior to publication.
1973	27	1	27	1	I suggest the authors increase the font in the text in Fig. 7.3 [William Lahoz, Norway]	Copyedit to be completed prior to publication.
25119	27	1	27	3	Text fonts are too small [Junguo Liu, China]	Copyedit to be completed prior to publication.
10419	27	1	27	4	Fig 7.3 is hard to interpret. For example, does low uncertainty for expansion of ag into tropical forest mean that there is low uncertainty over the impact if this occurs, or low uncertainty over the probability that it will occur? [Jean-Luc Chotte, France]	Accepted. Figure has been revised and improved. See 7.6.6
10421	27	2	27	3	The figure title is hard to follow and does not reflect the content, nor the text description which states that it presents case studies and examples. [Jean-Luc Chotte, France]	Accepted. Figure has been revised and improved. See 7.6.6
40861	27		27		Why are stranded assets in Figure 7.3? I do not understand the specific relevance for SRCL. [Valerie Masson-Delmotte, France]	Accepted. Figures have been revised and improved.
7483	27	28			The figure 7.3 - the conceptualizing key, substantive and emergent risks in relation to trade-offs to SDG and 3 other goals requires relabelling. In addition figure 7.4 should be relabelled. The two tables font size are too tiny and obscured. [Onema Adojoh, United States of America]	Accepted. Figure has been revised and improved. See 7.6.6
17935	28	0	28	0	The maps in figure 7.4 (a) and (b) are not clear. Such maps should be sourced from authentic sources like concerned Government sources. [Nayanika Singh, India]	Noted. Maps deleted.
17941	28	7	28	8	The sentence may be redrafted to read as "Keeping in view its development agenda, particularly the eradication of poverty coupled with its commitment to following the low carbon path to progress and being sanguine about the unencumbered availability of clean technologies and financial resources from around the world, India communicated its Intended Nationally Determined Contributions in response to UNFCCC COP decisions 1/CP.19 and 1/CP.20 for the period 2021 to 2030. Eight NDCs were communicated which included - climate-friendly lifestyles, increase cumulative non-fossil fuel based installed electric power capacity, reduce emission intensity of its GDP and create an additional carbon sink through forest and tree cover." [Nayanika Singh, India]	The title and the contents of the case study have been thoroughly revised. It is much more international with a moderate focus on emerging challenges in India.
39989	28	7	28	14	The assessment should cite specific sources and avoid commentary on Parties' positions (e.g., "ambitious"). [, United States of America]	Revised accordingly
17943	28	8	28	8	The use of "was" in the sentence "the renewable energy target was to increase....." is incorrect as the NDCs are to be implemented post 2020. Please correct this paragraph, accordingly. [Nayanika Singh, India]	Noted
5605	28	12	28	14	Assuming this paragraph is from Paris agreement, I believe at least these two lines need reference! [Sanaz Moghim, Iran]	Revised
32307	28	14	28	14	Small Hydro Power (SHP) [Sofie Linder, Sweden]	Added
17945	28	16	28	18	While mentioning India's revised renewable energy targets, there is a need to refer to appropriate Government of India reference which is presently missing. [Nayanika Singh, India]	Revised
17947	28	23	28	23	Reference by Marccacci 2018 is from Forbes magazine and is from not a peer-reviewed publication. IPCC must refrain using information from such popular publications. [Nayanika Singh, India]	All problematic references have been removed.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
32309	28	23	28	23	impacts on the coal sector (Marcacci 2018). [Sofie Linder, Sweden]	Removed and replaced with peer-reviewed paper. Also refer to http://envfor.nic.in/sites/default/files/press-releases/revised%20PPT%20Press%20Conference%20INDC%20v5.pdf
7195	28	25	28	25	Clarify what SHPs stand for. [Debra Roberts, South Africa]	Done
17949	28	25	28	27	The conclusion drawn in this sentence is serious and requires substantiation. [Nayanika Singh, India]	Noted
23915	28	1	29	27	As a principle, IPCC reports are policy relevant and not policy prescriptive. The case study depicts India's programmes on Renewable Energy and Green India Mission in poor light. These prejudicial, prescriptive and judgmental statements without robust scientific, technical data should be dropped. [, India]	The title and the contents of the case study have been thoroughly revised. It is much more international with a moderate focus on emerging challenges in India.
22893	28	1	29	47	This case study is not appropriate to what is discussed in this section and most of what is discussed is only of limited relation to 'land'. Actually, it is all about options in the energy transition and the tradeoffs of these options on sustainability challenges on land. This fits better in Ch 6. Furthermore, the language and choices made are very opinionated and effect sizes of traditional energy impacts on biodiversity and water are not compared adequately with the tradeoffs of alternative energy sources. Suggestion is to remove this case study as it does not add value to the chapter and leads to an unnecessarily long chapter. Policy responses are only addressed very narrowly. [Anastasios Kentarchos, Belgium]	The title and the contents of the case study have been thoroughly revised. It is much more international with a moderate focus on emerging challenges in India.
10387	28	1	29	47	This case study is not appropriate to what is discussed in this section and most of what is discussed is only of limited relation to 'land'. Actually, it is all about options in the energy transition and the tradeoffs of these options on sustainability challenges on land. This fits better in Ch 6. Furthermore, the language and choices made are very opinionated and effect sizes of traditional energy impacts on biodiversity and water are not compared adequately with the tradeoffs of alternative energy sources. Suggestion is to remove this case study as it does not add value to the chapter and leads to an unnecessarily long chapter. Policy responses are only addressed very narrowly. [Jean-Luc Chotte, France]	The title and the contents of the case study have been thoroughly revised. It is much more international with a moderate focus on emerging challenges in India.
17963	28	1	29	47	The purpose of writing a negatively about India's efforts to promote renewable energy and waterways is incorrect. It presents one-side of the story drawn from the disjointed, fragmented information sources many of which are not even well researched or peer reviewed. [Nayanika Singh, India]	The contents of the case study have been thoroughly revised. It is much more international with a moderate focus on emerging challenges in India.
17951	28	32	29	2	Small Hydro Power (SHP) is recognized to play a critical role in improving the overall energy scenario of the country and in particular for remote and inaccessible areas. SHPs (<25MW) are only exempt from Environmental Clearance however, such projects require mandatory approval and consent to establish and operate from State Pollution Control Boards, no objection certificates from different state government departments including fisheries, irrigation, revenue among others along with a techno-economic clearance from the State Electricity Board. SHPs are promoted as decentralized source of energy to remote inaccessible regions. There are no authentic reports of loss of biodiversity and environmental degradation due SHPs in western ghats and himalayan region. [Nayanika Singh, India]	The title and the contents of the case study have been thoroughly revised. It is much more international with a moderate focus on emerging challenges in India.
40863	28		30		descriptive style of case studies, sharpen the assessment, provide key findings at the end. [Valerie Masson-Delmotte, France]	Noted
27339	28	1			Please reformulate the question, this is not appropriate IPCC language. [, Germany]	The title and the contents of the case study have been thoroughly revised. It is much more international with a moderate focus on emerging challenges in India.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
28697	28	4		38	In the case of India, the targets should be on green cover. Heavy investment in renewable energy, forest green wall. I recommend an integrated Green wall, green cover, heavy investment in remote sensing and Geographic Informatics System to help combat the needs of mapping of the entire landscape and solution to the future plan of renewable energy as the case of heavy forest cover and tree planting. Public awareness is also needed as for human population growth and people should change the way they live. Re-Use and Re-Plant process should also be implemented by the government of India. [Abiodun Adegoke, Nigeria]	Revised case-study is less focused on India
3739	28	15		17	size [Cordula Ott, Switzerland]	Done
17953	29	2	29	2	Reference by Jumani et al and Chhatre and Lakhanpal are not robust enough to draw a representative adverse conclusion on the impact on SHPs in India. [Nayanika Singh, India]	These are peer-reviewed articles in good journals based on actual field studies.
17955	29	3	29	3	The sentence "Another unfortunate victim of India's renewable energy targets is the highly endangered Great Indian Bustard....." is factually incorrect and should be deleted. The sentence is negative and sends a wrong signal especially when the world is moving towards cleaner and greener fuel sources to meet 1.5 degree C scenario. [Nayanika Singh, India]	Have revised the section so that the impact of renewable energy infrastructure is an added impact after decades of other pressures.
17957	29	3	29	14	The habitat of Great Indian Bustard is under threat due to several other factors and not because of renewable energy alone. The GOI guidelines (2012) cited in the paragraph are under implementation. Both central government and state government of Rajasthan has initiated Species Recovery Programme. The results of implementation needs to be mentioned in this paragraph. [Nayanika Singh, India]	Revised text to point out other threats to the species over multi-decadal time-scales that caused its decline and that renewable energy and power lines are very recent.
1975	29	5	29	5	I suggest the authors remove "lethal". Omit needless words. [William Lahoz, Norway]	Removed.
32311	29	6	29	6	of species whose global [Sofie Linder, Sweden]	Done
17959	29	13	29	13	References by Thaker et al., 2018 and Northrup et al., 2013 do not lead to the conclusion which is mentioned in the sentence (line 11 to 14) here. The sentence is generic and may be deleted. [Nayanika Singh, India]	Revised sentence but retained the references. In general many regions around the world, wind-mills and solar farms pose a threat to many other species especially predatory birds and insectivorous bats (Thaker, M, Zambre, A. Bhosale 2018) and disrupt habitat connectivity (Northrup and Wittemyer 2013).
17961	29	15	29	27	At a global level, waterways are considered relatively eco-friendly means of transportation. Dredging is a practice followed across the world especially in China and Europe. Some of the identified stretches for inland waterways promotion are habitat of gangetic river dolphin. It is important to note that Indian rivers are home to unique floral and faunal biodiversity. While granting permission for inland waterway projects requisite environmental and social considerations are taken into account. The references cited in this paragraph are fragmented and incomplete. [Nayanika Singh, India]	The title and the contents of the case study have been thoroughly revised. It is much more international with a moderate focus on emerging challenges in India.
5607	29	28	29	32	this part need to write more carefully [Sanaz Moghim, Iran]	Revised
17937	29	44	29	44	Saluja, N and Singh 2018 is a newspaper report of Economic Times which should be strictly avoided. [Nayanika Singh, India]	Removed

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
21353	29	44	29	47	The sentence "So the negative impacts of coal based power continue even as emerging renewable energy is having its own ecological trade-offs." fails to convey the fact that, even if India's 55% renewable energy 2030 target is missed, there will still be significant benefits arising from a reduction in coal use and could be misinterpreted as unless the target is reached, there are no benefits. This could be amended by saying "So some negative impacts of coal based power continue even as emerging renewable energy is having its own ecological trade-offs, although some have been avoided as the proportion of coal use has decreased." [, United Kingdom (of Great Britain and Northern Ireland)]	Have revised the entire section
30017	30	4	30	4	Delete ", food, and". This does not make sense in the sentence. [, Netherlands]	Copyedit to be completed prior to publication.
30021	30	5	30	5	Same comment as above. [, Netherlands]	Noted
585	30	6	30	8	in economics, mass quantity can cause an increase in prices. Furthermore commodity prices are highly dependent on financial markets and speculation. [Nathalie Hilmi, France]	Noted, section has been revised
28867	30	6	30	8	Could you indicate the countries involved? it will sensitize their government to adapt a suitable policy response. [Samir Hassani, Algeria]	Noted - but we don't have the space to identify specific countries
587	30	20	30	20	in monetary terms (not economic) [Nathalie Hilmi, France]	Copyedit to be completed prior to publication.
589	30	21	30	21	monetary sens (not economic) [Nathalie Hilmi, France]	Copyedit to be completed prior to publication.
27341	30	21	30	42	Quantitative information on the costs of land degradation would be very interesting to include in the ES and in the SPM, e.g. "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 (Nkonya et al. 2016). Most studies show increasing effects on GDP as global mean temperatures increase (level of confidence)". Please consider. [, Germany]	Accepted
32313	30	22	30	22	Studles estimates the global value of ecosystem services [Sofie Linder, Sweden]	Copyedit to be completed prior to publication.
30171	30	27	30	29	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. [, Netherlands]	Noted - this section has been revised and moved. More detail added in cross chapter box on economics
5609	30	33	30	33	what the "increasing trend" means? Positive effect! and it needs reference [Sanaz Moghim, Iran]	Accepted
591	30	33	30	34	Maybe not in all countries? [Nathalie Hilmi, France]	Accepted, revised.
17153	30	34	30	35	check the statement [Wesam Madhoun, Malaysia]	Accepted and revised
7197	30	37	30	37	Are emission scenarios also factored into the projections? [Debra Roberts, South Africa]	The studies use a range of assumptions about emissions
24807	30	1	31	11	Section 7.4.1 (Economic considerations - what is at stake). This literature review has already been covered extensively in different ways in previous chapters. Consider revising -- for example, if GDP went down, what would that mean for risk? GDP rises and falls in countries all of the time, what is special here? So in this section, do a quick cross check of other chapters on the facts you're presenting, and delete the overlaps, and dig deeper to illustrate risks of economic consequences (by sector, for livelihoods, for provision of basic needs, for political concerns ... like is there evidence to show radicalisation if basic needs are shocked, etc.)? [Justice Issah Musah Surugu, Germany]	Noted, thank you. A cross-chapter box on economic dimensions has been developed which covers some of these issues, within the space constraints of the chapter

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
39991	30	33	31	11	Economic considerations are a very important topic, but this discussion should be revised. The discussion of general studies of economic impacts of climate change, not specific to the land sector or food security, is outside the scope of the report and should be deleted, unless it is carefully linked to the land sector. The discussion in this section also fails to consider the important issue of mitigation costs; these should be addressed for balance. The reference to the range of natural variability is unclear. [, United States of America]	Noted - this section has been revised and moved to a cross-chapter box on economics. The natural variability sentence has been removed.
29713	30	43	31	5	Examples of losses in the Caribbean from extreme events could also be relevant to the discussion of economic costs of climate change, and more information on adaptation costs would be most valuable [, Saint Lucia]	Noted
2187	30	1	37	48	This section introduces the impact of climate-land change on the global economy, but does not take the SCC (Social Cost of Carbon) into account. SCC can be used to measure the externality of carbon emissions, and it also provides an effective analysis tool for government departments to carry out cost-benefit analysis on the management regulations of carbon emissions. Therefore, I suggest that if you discuss on the economic impact caused by climate-land change, it should also be illustrated from the perspective of SCC. Please consider adding materials in this aspect. [Xiangzheng Deng, China]	Noted, thank you. A cross-chapter box on economic dimensions has been developed which covers the SCC
21631	30	1			The discussion in section 7.4.1 seems to miss the point that the main reason for widespread deployment of BECCS is that people are well aware of the impacts of climate change, and that BECCS simply seems as a relatively cheap option to reduce net emissions (rather than higher-cost reductions of gross emissions). It would help to bring this currently rather generic discussion, which goes well beyond the scope of this report, back to why the land sector is a potential crunch point - and it's generally not because people aren't aware of the economic impacts of climate change. [Andy Reisinger, New Zealand]	Noted, thank you. A cross-chapter box on economic dimensions has been developed which addresses these issues.
6401	30	1			This is a very useful section. It would be helpful to clarify whether the costs assessed comprehensively include damages, mitigation costs and adaptation costs. More information on adaptation costs would be important in this section. Can anything be said more specifically about the economic challenges faced by least developed countries? [, Gambia]	Noted - this section has been revised and moved. More detail added in cross chapter box on economics
12321	30	1			The section title is misleading, because the section is not only about economic costs (also other values, livelihoods and migration). Also, more emphasis should be on non-monetary losses. Maybe include an explicit subsection for this? See Barnett, J., P. Tschakert, L. Head and W. N. Adger, 2016: A science of loss. Nature Climate Change, 6 (11), 976-978, doi:10.1038/nclimate3140. [Hans Poertner and WGII TSU, Germany]	Noted, thank you. A cross-chapter box on economic dimensions has been developed which covers more of these issues including non-monetary losses.
24809	31	13	31	14	Sentence structure: not clear what "these impacts" refer to, doesn't flow well. Reword sentence [Justice Issah Musah Surugu, Germany]	Sentence no longer there
22895	31	13	31	20	This is very pertinent to this chapter. Expansion of the evidence on the problems of delineating blurred costs between impacts and adaptation is important. This section may well be elaborated as this is where synthesis of evidence is needed to support policies and this must be highlighted in the summary. [Anastasios Kentarchos, Belgium]	as above

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
10389	31	13	31	20	This is ery relevant part and of high relevance to this chapter. Expansion of the evidence on the problems of delineating blurred costs between impacts and adaptation is important. This section may well be elaborated as this is where synthesis of evidence is needed to support policies and this must be highlighted in the summary. [Jean-Luc Chotte, France]	Section has been restructured but will keep this paragraph and elaborate
28869	31	13	31	48	Personally, I am really impressed on the fact reported in the section 7.4.1.1. My question is; why policy makers are still unable to take action? is it because most of data presented are from simulation where the uncertainty is high? [Samir Hassani, Algeria]	Noted - some of the reasons why policy makers do not take action are now discussed in a cross chapter box on economics
7671	31	19	31	20	the statement is made that " The value and accuracy of these aggregated costs is questionable, compared with more detailed sectoral level studies" This statement suggests that one can get accurate costs of residual risk. A better way of communicating what the authors I think are trying to say would be " "the value of such aggregated costs iare characterised by large uncertainties and only orders of magnitude may be gained" . It is unclear why more detailed studies would have fewer uncertainties because they are also based on uncertain futures that can only be assessed using plausible scenarios of the future. THis particularly applies to adaptation action. [Judy Lawrence, New Zealand]	The sentence regarding sectoral studies was not intended to refer to residual risk: it was more in comparison with aggregate costs of adaptation. But this paragraph has now been removed.
30147	31	23	31	23	Change "inaction" to "action" (as also confirmed by statement D2). [, Netherlands]	Thank you for pointing this out
14805	31	39	31	41	Zambezi Valley and Limpopo Basin Where is this, please write name of the country [Mahmood Riyaz, Maldives]	Added
39993	31	12	32	44	The costs and timing of action is an important topic, but the discussion that follows is not specific to the scope of the report -- the interactions of climate change with land and food security. It should be significantly narrowed to focus on this topic, e.g., by deleting all but the last three paragraphs. Also note that many of the claims in the third paragraph are of questionable direct relevance to the question of the cost of action and inaction in the land sector. [, United States of America]	We have removed some of this section (and moved to later in the chapter), but we disagree that only the last three paras contain relevant information. There is information relating to droughts and floods in previous paragraphs
14807	31	21	32	44	How do you directly link the figures and number and estiamtes given in the section with climate change? Is it only based on the perception that acting on climate change involves trade-offs with economic growth "perception only" no evidence?? [Mahmood Riyaz, Maldives]	The section attempts to show that rather than creating a trade-off with economic growth, action will be less expensive than inaction.
27343	32	28	32	32	Please consider lifting the following statement to the ES and SPM: "Not only is timing important, but the type of intervention itself can influence returns (high agreement, high evidence). Policy packages that make people more resilient - expanding financial inclusion disaster risk and health insurance, social protection and adaptive safety nets, contingent finance and reserve funds, and universal access to early warning systems – could save 100 billion USD a year, if implemented globally (level of confidence)." [, Germany]	Accepted
40865	32	36	32	36	prescriptive tone (need to) [Valerie Masson-Delmotte, France]	Noted. Section has been deleted.
14809	32	45	33	22	Do you mean that people move to manage risks from low risk areas to high risk areas such as coastal areas seeking livelihood and educational opportunities and being trapped in precarious, unsafe situations by choice? And this is a way of managing risks?? [Mahmood Riyaz, Maldives]	Accepted. Language clarified as to motivations for migration.
21899	32	41		44	7.4.1.1. The cost and Timing of action. Please recast the sentence [Olusegun Adeaga, Nigeria]	Noted
12323	32	45			This section is unbalanced regarding generic/conceptual links of climate change and migration and specific land-related concerns. [Hans Poertner and WGII TSU, Germany]	Noted. This section has been revised and added to. Space limits constrain how in depth this topic can be dealt with.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
5611	33	6	33	8	better to re-write, what the author means by "changing exposure to climate change"! [Sanaz Moghim, Iran]	Copyedit to be completed prior to publication.
32315	33	28	33	28	globally (GFDRR World [Sofie Linder, Sweden]	Copyedit to be completed prior to publication.
32317	33	34	33	34	people around [Sofie Linder, Sweden]	Copyedit to be completed prior to publication.
32319	33	35	33	35	drought and [Sofie Linder, Sweden]	Copyedit to be completed prior to publication.
32321	33	37	33	37	1998). Amongst [Sofie Linder, Sweden]	Copyedit to be completed prior to publication.
21355	33	38	33	38	Saying El nino was 'specifically responsible' for the spread of Zika makes it sound as if it was the only / the predominant cause. It may be better to say it was 'a contributing factor', as the underlying study makes clear [, United Kingdom (of Great Britain and Northern Ireland)]	Noted. Box is deleted.
40867	33		34		Why is this box on ENSO here?Check very carefully consistency with AR5, new developments since AR5, and SROCC (chapter 6) to ensure coherency. SR15 has some lines as well in their chapter 3. [Valerie Masson-Delmotte, France]	Noted. Box is deleted.
40869	33		34		I am not convinced that the assesment of ENSO changes fully belongs to SRCL and am nervous that this assessment will be challenged by AR6 WGI in a few months. Contact authors for SROCC and SRCL can be provided. What is missing is a discussion of ENSO in a changing climate : variability on top of trends; changing characteristics in a warmer world. Benefits of improved seasonal forecasts. [Valerie Masson-Delmotte, France]	Noted. Box is deleted.
39995	33	24	36	2	The discussion of ENSO in Box 7.2 is interesting but much too expansive, given the space allocated to this chapter. Also, it fails to address important implications within the report's scope, such as the implications of ENSO on carbon storage, peat and wildland fires, and droughts, at both a global and regional scale. [, United States of America]	Noted. Box is deleted.
10423	33	24	36	2	Is this box incomplete? There is no discussion on SLM in this box. [Jean-Luc Chotte, France]	Noted. Box is deleted.
12325	33	24			Box could be shortened, it is partly too descriptive (first half). [Hans Poertner and WGII TSU, Germany]	Noted. Box is deleted.
28617	36	7	36	8	The statements is in contrast to chapter 3 (p. 41), citing medium evidence and medium agreement. [Nina von Uexkull, Sweden]	Noted. Consistency of language has been reviewed.
28619	36	7	36	8	Publications after 2014 increasingly find linkages of climate variability to violent conflict and related phenomena while the directions are not always clear. In particular, while there is very mixed evidence for the onsets of new conflicts, many studies accounting for factors increasing vulnerabilityfind a linkage iwth ongoing conflict/Incidence CF. Theisen, Ole Magnus. 2017. "Climate Change and Violence: Insights from Political Science." Current Climate Change Reports 3 (4): 210–21. https://doi.org/10.1007/s40641-017-0079-5 . The assessment should therefore clarify that it relates to the onset of tensions and conflict where there is indeed not much evidence and agreement, such as "there is little evidence and little agreement that climate change has lead to political tensions and violent conflict to date." [Nina von Uexkull, Sweden]	Noted. Section has been rewritten however space limits have prevented expansion.
32323	36	15	36	15	vulnerable communities [Sofie Linder, Sweden]	Copyedit to be completed prior to publication.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
28621	36	16	36	17	There are several studies on sustained droughts and conflict that could be cited here such as Kelley, Colin P., Shahrzad Mohtadi, Mark A. Cane, Richard Seager, and Yochanan Kushnir. 2015. "Climate Change in the Fertile Crescent and Implications of the Recent Syrian Drought." Proceedings of the National Academy of Sciences 112 (11): 3241–46. https://doi.org/10.1073/pnas.1421533112 . Uexkull, Nina von, Mihai Croicu, Hanne Fjelde, and Halvard Buhaug. 2016. "Civil Conflict Sensitivity to Growing-Season Drought." Proceedings of the National Academy of Sciences 113 (44): 12391–96. https://doi.org/10.1073/pnas.1607542113 . [Nina von Uexkull, Sweden]	Noted. Section has been rewritten but is constrained due to space.
32325	36	17	36	17	droughts (Wilhite [Sofie Linder, Sweden])	Copyedit to be completed prior to publication.
39997	36	18	36	19	This statement reflects a value judgment that is likely not appropriate for an IPCC report. As it relies on a source from 2005, it is arguably not "current." [, United States of America]	Noted. Section has been revised.
12661	36	26	36	26	Suggest that the should be a box on deep uncertainty, prior to Box 7.3, especially for longer time-scales of climate change. [Zelina Binti Zaiton Ibrahim, Malaysia]	Noted. Unable to add due to space constraints.
7563	36	30	36	37	Some feedbacks are not readily included in model calculations, particularly those relating to carbon released from thawing permafrost and from wetlands, which leads to risks of overshoot are tipping points and feedbacks that once surpassed cannot be easily or quickly rectified. See Xu and Ramanathan (2017) Well below 2 °C: Mitigation strategies for avoiding dangerous to catastrophic climate changes, Proc. Natl. Acad. Sci., doi: 10.1073/pnas.1618481114; Lenton et al. (2008) Tipping elements in the Earth's climate system, PNAS 105(6):1786–1793; Drijfhout S., et al. (2015) Catalogue of abrupt shifts in Intergovernmental Panel on Climate Change climate models, PROC. NAT'L. ACAD. SCI. 112(43):E5777–E5786; and Committee to Prevent Extreme Climate Change (2017) Well Under 2 Degrees Celsius: Fast Action Policies to Protect People and the Planet from Extreme Climate Change. [Durwood Zaelke, United States of America]	Noted. Box is deleted.
7639	36	30	36	37	Some feedbacks are not readily included in the calculations, particularly those relating to carbon released from thawing permafrost and from wetlands, which leads to risks of overshoot are tipping points and feedbacks that once surpassed cannot be easily or quickly rectified. See Xu and Ramanathan (2017) Well below 2 °C: Mitigation strategies for avoiding dangerous to catastrophic climate changes, Proc. Natl. Acad. Sci. 114(39):10315–10323. [Kristin Campbell, United States of America]	Noted. Box is deleted.
40001	36	35	36	37	The claim that "recent evidence suggests ... that at 2°C the Earth may irreversibly enter a hothouse Earth pathway" seems to be an overreading of the Steffen et al. paper. The paper itself says, "Precisely where a potential planetary threshold might be is uncertain (15, 16). We suggest 2°C because of the risk that a 2°C warming could activate important tipping elements (12, 17), raising the temperature further to activate other tipping elements in a domino-like cascade that could take the Earth System to even higher temperatures (Tipping Cascades)." The Steffen et al. paper bases this conjecture on two papers from 2016 and 2008 that were available to the authors of the 1.5°C SR, yet this conclusion conflicts with the just-published conclusion of 1.5°C SR about tipping points, which suggests that they are likely to lie at much higher temperatures. The Steffen et al. paper is not providing new evidence but presenting a framework for thinking about previous evidence, some of which is not recent. Suggest deleting this sentence. [, United States of America]	Noted. Box is deleted.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
32327	36	36	36	36	Earth system [Sofie Linder, Sweden]	Copyedit to be completed prior to publication.
32329	36	39	36	39	dieback (Steffen et [Sofie Linder, Sweden]	Copyedit to be completed prior to publication.
32331	36	44	36	44	Semenza 2016). Irreversible [Sofie Linder, Sweden]	Copyedit to be completed prior to publication.
10425	36	47	36	47	What does the tipping point represent? ie transition from what to what state? [Jean-Luc Chotte, France]	Noted. Box is deleted.
32333	36	47	36	47	point but [Sofie Linder, Sweden]	Copyedit to be completed prior to publication.
22897	36	26	37	30	Tipping points are very central to the theme of risk and should form a core topic of this chapter. Rather than just describing the concept of tipping points a review (with table?) of documented tipping points and associated risks in the literature should be provided. This would be very useful and based on this an assessment of the locations and processes under risk due to these tipping points could be prepared. [Anastasios Kentarchos, Belgium]	Rejected. Tipping points have not been covered per se. Chapter covers risk thresholds.
13221	36	26	37	30	add reference to Leadley et al Interacting regional-scale regime shifts for biodiversity and ecosystem services 2014 BioScience. At line 5 on page 37. [David Cooper, Canada]	Noted. Section has been deleted.
39999	36	26	37	30	It would be helpful to focus Box 7.3 more tightly on the land sector. In particular, the last paragraph could be expanded to provide more detail about the feedbacks and transitions that are discussed. [, United States of America]	Noted. Box is deleted.
10391	36	26	37	30	Tipping points are very central to the theme of risk and should form a core topic of this chapter. Rather than just describing the concept of tipping points a review (with table?) of documented tipping points and associated risks in the literature should be provided. This would be very useful and based on this an assessment of the locations and processes under risk due to these tipping points could be prepared. [Jean-Luc Chotte, France]	Rejected. Tipping points have not been covered per se. Chapter covers risk thresholds.
40871	36		37		Box 7.3 . The tone of the first sentences is not adequate for a solid and rigorous assessment of the state of knowledge. It is not providing clear evidence from e.g. paleoclimate (see SR15 box on warmer worlds), on confidence in models to explore this. Other chapters are thin on tipping points and abrupt change. Consistency with SR15 (chapter 3, box 3.8 I think on regional tipping points) and SROCC (chapter 6) to be ensured to avoid inconsistencies on these issues, which are associated with deep uncertainty. I suggest to reconsider carefully the content of the box and its style. There is NO HIGH CONFIDENCE THAT TIPPING POINTS WILL BE REACHED FOR >1.5°C (SR15 provides low confidence on this). The issue of tipping point and societal collapse also deserves a very careful assessment. Does SRCCL have the expertise across chapters to do this in depth and rigorously? This will be a potentially highly visible outcome of the report, but the rigor of the assessment of the literature is key. DEep uncertainty needs to be explained better (maybe in ch 1) in relationship to defintiions in chp 1 of SROCC, and examples need to be developed here with a SRCCL grounding. More substance is needed on this aspect. [Valerie Masson-Delmotte, France]	Noted. Box has been deleted.
21901	36	12		14	7.4.1.2. Risk and where and how people live: Migration, Urbanisation, social Cohesion. Please rewrite the sentence [Olusegun Adeaga, Nigeria]	Accepted. Section is rewritten.
27345	36	44			Tipping points are per definition irreversible, please revise. [, Germany]	Noted. Box is deleted.
32335	37	5	37	5	observed trends in climate phenomena like the South Asian Monsoon (Saha et al. 2014) [Sofie Linder, Sweden]	Copyedit to be completed prior to publication.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
32257	37	6	37	10	In the study "Diverging importance of drought stress for maize and winter wheat in Europe" (Webber H. et al., 2018) results reveal that for the current genotypes and mix of irrigated and rainfed production, climate change would lead to yield losses for grain maize and gains for winter wheat. Across Europe, on average heat stress does not increase for either crop in rainfed systems, while drought stress intensifies for maize only. In low-yielding years, drought stress persists as the main driver of losses for both crops, with elevated CO2 offering no yield benefit in these years. [Carmela Cascone, Italy]	Noted. Box is deleted.
32571	37	8	37	10	With CO2 fertilization, impacts accumulation of seed fat in soybean, and significantly decreased protein concentration in soybean seeds (Li et al 2018). Dong et al., (2018) have found that elevated CO2 (eCO2) "increased the concentrations of fructose, glucose, total soluble sugar, total antioxidant capacity, total phenols, total flavonoids, ascorbic acid, and calcium in the edible part of vegetables by 14.2%, 13.2%, 17.5%, 59.0%, 8.9%, 45.5%, 9.5%, and 8.2%, respectively, but decreased the concentrations of protein, nitrate, magnesium, iron, and zinc by 9.5%, 18.0%, 9.2%, 16.0%, and 9.4%". The change in nutrient content has ecosystem-wide implications, that is quiet not captured in this report. For examples, studies such Ziska et al 2016 have shown that rising CO2, is reducing protein concentration in pollen, which is the source of food/energy for bees. Potentially the effect on bee health due to decreased protein content can have imilications on all organisms in the food chain upstream of the bees. This wider and longer impact- which is critical for all life systems- is something that needs to be brought to attention in this report. Impact of Elevated CO2 on Seed Quality of Soybean at the Fresh Edible and Mature Stages. Yansheng Li1 Zhenhua Yu1 Jian Jin1, Qiying Zhang, Guanghua Wang, Changkai Liu, Junjiang Wu, Cheng Wang and Xiaobing Liu. Front. Plant Sci., 17 October 2018 Effects of Elevated CO2 on Nutritional Quality of Vegetables: A Review. Jinlong Dong, Nazim Gruda, Shu K. Lam, Xun Li and Zengqiang Duan. Front. Plant Sci., 15 August 2018 Rising atmospheric CO2 is reducing the protein concentration of a floral pollen source essential for North American bees. Lewis H. Ziska, Jeffery S. Pettis,2 Joan Edwards,3 Jillian E. Hancock,3 Martha B. Tomecek, Andrew Clark, Jeffrey S. Dukes, Irakli Loladze, and H. Wayne Polley. Proc Biol Sci. 2016 Apr 13; 283(1828): 20160414. [Neeraja Havaligi, United States of America]	Noted. Box is deleted.
26047	37	8	37	11	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 it 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 given recent studies based on AGMIP results that lower yield in warmer climate is related to N limitation. [Haroon Kheshgi, United States of America]	Noted. Box is deleted.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
23225	37	9	37	10	This part may be a bit misleading. I suggest to add "without CO2 fertilization, effective adaptation, and genetic improvement" like Abstract of Zao et al (2017). Also, better to put "see section 5.2.4.3" for "CO2 fertilization effects will impact nutrition". (also in SPM A2.3) [Kaoru Tachiiri, Japan]	Noted. Box is deleted.
32337	37	13	37	13	tipping points. A major [Sofie Linder, Sweden]	Copyedit to be completed prior to publication.
32339	37	14	37	14	deeply uncertain because bold text? [Sofie Linder, Sweden]	Copyedit to be completed prior to publication.
7565	37	16	37	30	When the uncertainty of climate sensitivity and climate feedbacks like released carbon from permafrost thaw are considered, the "fat tail" risk of warming extends into the catastrophic range; see Xu and Ramanathan (2017) Well below 2 °C: Mitigation strategies for avoiding dangerous to catastrophic climate changes, Proc. Natl. Acad. Sciences and and Committee to Prevent Extreme Climate Change (2017) Well Under 2 Degrees Celsius: Fast Action Policies to Protect People and the Planet from Extreme Climate Change; Ramanathan and Feng (2008) On avoiding dangerous anthropogenic interference with the climate system: Formidable challenges ahead, Proc. Natl. Acad. Sci., doi: 10.1073/pnas.0803838105; Weitzman M. (2011). Fat-Tailed Uncertainty in the Economics of Catastrophic Climate Change. Review of Environmental Economics and Policy 5(2):275-292. [Durwood Zaelke, United States of America]	Noted. Box is deleted.
7641	37	16	37	30	When the uncertainty of climate sensitivity and climate feedbacks like released carbon from permafrost thaw are considered, the "fat tail" risk of warming extends into the catastrophic range; see Xu and Ramanathan (2017) Well below 2 °C: Mitigation strategies for avoiding dangerous to catastrophic climate changes, Proc. Natl. Acad. Sci. 114(39):10315–10323. [Kristin Campbell, United States of America]	Noted. Box is deleted.
10427	37	21	37	22	Agree, but please provide some references to this "high evidence" (and do you mean robust evidence?)Suggested references: Walker, B.H., Carpenter, S.R., Rockstrom, J., and others. 2012. Drivers, "slow" variables, "fast" variables, shocks, and resilience. Ecology and Society 17(3): 30. Armitage, D. 2007. Building Resilient Livelihoods through Adaptive Co-Management: The Role of Adaptive Capacity. In: ARMITAGE, D., BERKES, F. & DOUBLEDAY, N. (eds.) Adaptive Co-Management. Vancouver: UBC Press, 62-82. [Jean-Luc Chotte, France]	Noted. Box is deleted.
40003	37	31	37	48	This paragraph should be deleted or significantly reworked. It contains numerous generalizations that the text does not link back to the land sector. The last three sentences contain vague, indefensible, and sweeping statements ("climate change impacts ... are catastrophic. Usually catastrophic climate events awaken the people ...") that have no place in an IPCC assessment. [, United States of America]	Accepted. Section revised and last three sentences deleted.
12327	37	31	37	48	Is this paragraph still part of the section on migration? If yes, the connection is not clear. Or is it part of the box? [Hans Poertner and WGII TSU, Germany]	Accepted. Revised. New heading added.
12329	37	45	37	48	The phrasing is misleading. Suggest to state explicitly that this is a finding from SREX and not a new assessment finding here. [Hans Poertner and WGII TSU, Germany]	Accepted. Section revised and last three sentences deleted.
5613	37	45	37	48	This part is not right in some regions particularly developing countries, it is good to say this or mention the region that responded properly to climate change. [Sanaz Moghim, Iran]	Accepted. Last three sentences deleted.
40873	37		37		"catastrophic" : is this the adequate tone for an assessment? How do you define catastrophic, is it justified to link disasters with climate awareness? What does the literature say on that, have you assessed it exhaustively? [Valerie Masson-Delmotte, France]	Accepted. Catastrophic has been deleted and section revised.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
6839	38	1	38	1	It describes multi-level policy response to risk (0), what does (0) mean? Please give a clear meaning. [Changke Wang, China]	Copyedit to be completed prior to publication.
40005	38	1	38	1	Section 7.5 and the following subsections are as much about financial instruments as about policy. Suggest retitling and reframing the chapter to acknowledge this. Much of the section would also benefit from editing to improve syntax. [United States of America]	Accepted. 7.5 Title changed to "Policy Instruments for Land and Climate"
7199	38	2	38	2	Why is the reference for 'multi-level policy response to risk' 0? [Debra Roberts, South Africa]	Accepted and revised to "Multi-level Policy Instruments (7.5.1)"
32341	38	2	38	2	risk (7.5.1), policy [Sofie Linder, Sweden]	Copyedit to be completed prior to publication.
40009	38	14	38	16	"Positive incentives (such as financial or regulatory instruments) are appropriate where the public net benefits are highly positive and the private net benefits are close to zero. This is likely to be the case for many GHG mitigation measures." It is not clear why the private benefit of many mitigation measures would be close to zero. As discussed in previous chapters, many measures (more effective water or fertilizer use, better agricultural practices, less food waste, agroforestry systems, better forest management) may have substantial private as well as public benefit. [United States of America]	Accepted and revised.
10429	38	34	38	35	awkward title - reword [Jean-Luc Chotte, France]	Accepted and revised to "Multi-level Policy Instruments"
5615	38	40	38	40	"local areas have high vulnerabilities and great need for climate resilience"! This why the author used this statement for local areas, this is a general valid statement. [Sanaz Moghim, Iran]	Accepted and this statement has been deleted so the sentence identifies local governments as key players.
32343	38	44	38	44	climate risks. As risk [Sofie Linder, Sweden]	Copyedit to be completed prior to publication.
40007	38	1	74	36	Section 7.5 is quite general, and might be applied to almost any topic. Suggest adding more land/climate-specific content to make its relevance to the report more obvious. [United States of America]	Accepted. The GHG Fluxes has been rewritten and targeted specifically to land climate agriculture carbon pricing and connections of policy instruments and their implications for land highlighted. However, it is unlikely agriculture will be part of carbon pricing unless carbon pricing initiatives already existing in other sectors advance and linkage of agriculture is made to these already existing initiatives.
3741	38	34		35	perhaps delete second 'risk'? [Cordula Ott, Switzerland]	Copyedit to be completed prior to publication.
10431	39	14	39	15	re integrated approaches, also cite Tengberg, A. and Valencia, S., 2018. Integrated approaches to natural resources management—Theory and practice. Land Degradation & Development. [Jean-Luc Chotte, France]	Accepted. Reference added.
40875	39		39		insights from Mora et al (Nature Climate Change) on threats to humanities due to cumulative hazards relevant for this assessment but not cited, I think. I suggest to be very cautious about climate change and storm characteristics. Are floods, droughts and cyclones climate-related hazards or impacts? [Valerie Masson-Delmotte, France]	Accepted. This is a good reference for drought instruments and conservation areas. Added to 7.5.6.2.
1977	40	1	40	1	To aid the reader, indicate in the caption to Table 7.2 what an "X" signifies. [William Lahoz, Norway]	Accepted
17507	40	1	40	2	Using "forest carbon offsets" and "REDD" together as if they were the same may still not be advisable, as REDD may include or exclude offsetting, depending on and in accordance with national policies. Also, acronym should be standardized to "REDD+" (see comment on line 6 above) [Dirk Nemitz, Germany]	Accepted, table has been considerably revised and programmes such as REDD+ removed to enable a focus on types of policies and instruments
1323	40		40		Trade-related, WTO policies, environmental goods and services [Oswaldo Lucon, Brazil]	Accepted, trade related policies (such as border adjustments) added
40011	40	1	41	1	Table 7.2 could be deleted to reduce the chapter length. [United States of America]	Accepted

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
10433	40	1	41	1	Table 7.2 Why is LDN listed as regional? LDN commitments are made and assessed at national level. Perhaps LDN is listed as regional because through UNCCD it applies only to drylands. However, it is also relevant to all nations via SDG 15.3, so should be listed as global. Also, LDN is listed under national but not columns are marked - should have LD and SLM marked. [Jean-Luc Chotte, France]	Noted - the table has been revised considerably to focus on types of policies and instruments without naming specific ones. Programmes and initiatives have been removed, as have management practices.
32985	40	1	41	1	It would be important to add 'protected area designation and management' as a relevant instrument from local to regional levels – not only because of the true significance of this instrument in its own right, but also because of the policy synergy between governments' UNFCCC and Convention on Biological Diversity targets and commitments. [Mairi Dupar, United Kingdom (of Great Britain and Northern Ireland)]	Accepted
21633	40	1			Table 7.2: there is a notable absence of international initiatives concerned with mitigation outcomes in agriculture, and those should be listed; for example the Climate and Clean Air Coalition, Global Research Alliance on Agricultural Greenhouse Gases, the 4 per mille initiative, FAO, the Climate Change, Agriculture and Food Security Programme of the CGIAR (which covers both adaptation and mitigation) - the selection criteria for initiatives listed as present is not clear. [Andy Reisinger, New Zealand]	Noted - the table has been revised considerably to focus on types of policies and instruments without naming specific ones. Programmes and initiatives have been removed.
25691	40	1			Some cells are surprisingly not ticked for some policies/programmes/instruments, including, inter alia: - REDD should be replaced by REDD+, and the cell about sustainable land management should be ticked, to highlight the role of forest carbon offsets and REDD+ in the promotion of sustainable forest management. - "Sustainable land management" and "GHG flux climate change mitigation" should be ticked for "forest fire management" [France]	Noted - the table has been revised considerably to focus on types of policies and instruments without naming specific ones. Programmes and initiatives have been removed. Ticked the suggested boxes for fire policy.
3743	41	21			also tap and build upon existing local social security nets! [Cordula Ott, Switzerland]	Noted - table has been revised to focus more specifically on policies and instruments. Social security safety nets would be covered under disaster assistance, direct income payments, subsidies etc.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
40139	42	1	42	22	<p>It is important to establish a sustainable economy in all regions of the planet in the era of global warming and uncertainty along the line mentioned below:</p> <p>All nations have been looking forward to attaining prosperity in this era of globalization, information and digital revolution. One cannot deny the fact that sustainability has become the major issue for all transition and advanced states alike, including countries in the Asia-Pacific region and beyond. In terms of society's actions towards promoting sustainability and sustainable development, it is important to first define sustainable development. There are many ways sustainable development can be defined. The most commonly used one is That from the Report for World Commission on Environment & Development in 1987: —Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs (Esnor 2011; Klien 2015). This early definition contains two important concepts: first, the concept of needs, which underlines that the world should prioritize the needs of the poor; and second, the idea of limitations, which reminds the world that it should use resources available in the environment with technology and social organization in a responsible manner. As we know, after all those years, the UN from January 2016 introduced a global program called —Sustainable Development Goal (SDG) with 17 goals to 2030, endorsed by 200 nations. In modern times, global higher education, development and training is the most important element of any society, and not only in giving or transferring knowledge. It is also core to the learning of all societies and its progress in applying scientific knowledge to new ventures, keeping in mind the costs and benefits to society and the nation at large. In estimating both social and economic costs and benefits of new innovations and discovery, science, social science and other relevant disciplines play a paramount role (Berkes et al. 2003; Relling 2011). As mentioned earlier, the UNFCCC and other stakeholders have, since the early 1990s, put huge investment globally into addressing the issue of global warming-induced climate change for achieving sustainable and responsible growth of nations, developed and developing alike. Most importantly, the COP21 outcome in Paris in 2015 gives major hope towards achieving this goal. In other words, the time has come to work for a sustainable economy goal across transition and advanced nations. In view of the above it is indeed essential to find pathways of a sustainable economy. One must make this term clear upfront: what does a sustainable economy mean? Having said this, there are many obstacles remaining in order to work effectively toward the goal of attaining a sustainable economy in the medium to long run. In view of the above, the individual studies in a volume by</p>	Noted. Literature considered and added where appropriate and space permitted. However, the focus on the section is on land and climate interactions. Much of this literature is very broad in focus.
24325	42	2	42	4	<p>this is a palliative approach to poverty by just responding to disaster that just treats symptoms. The document claims for a rejection of reactive approaches (see for example P44 L25) It is a pessimistic view that does not consider the need to address the root causes of people and communities trapped in chronic poverty, by addressing social exclusion, access to resources —such as land and water, or secure land tenure-, education and development of skills, or the development of public infrastructure [Urbano Fra.Paleo, Spain]</p>	Accepted. Section includes reactive approaches and addressing deep poverty.
40013	42	11	42	11	This statement is inappropriately prescriptive as drafted. [, United States of America]	Noted. Language is addressed at manner of risks or shocks, not at government.
32345	42	16	42	16	protected. If shock [Sofie Linder, Sweden]	Copyedit to be completed prior to publication.
40877	42		43		links between table and assessed literature? [Valerie Masson-Delmotte, France]	Noted. Unclear which table referred to.
1979	43	8	43	8	If using UK English, should be “programme”. Same elsewhere. [William Lahoz, Norway]	Copyedit to be completed prior to publication.
1981	43	33	43	34	Check use of parentheses. [William Lahoz, Norway]	Copyedit to be completed prior to publication.

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40017	43	34	43	48	The discussion of fire is rather prescriptive in that it seems to posit a single correct fire management approach. This should be revised to tease out the issues and tensions and avoid prescriptive implications. [United States of America]	Accepted. Section reordered so confidence statement at end moved to front and prescriptive language removed.
40015	43	24	47	9	Section 7.5.3 is more about financial instruments than policy. Suggest retitling and reframing to acknowledge this. It could be expanded beyond these two domains to address monitoring systems and other responses or DRR strategies. [United States of America]	Accepted. Early warning and monitoring systems added to section; name revised. DRR is part of Adaptive Climate Governance Responding to Uncertainty.
40879	44		44		where are droughts outside drylands (in ch 3) assessed (ch 2, 4?). [Valerie Masson-Delmotte, France]	Noted. A search of 'drought' in the SOD Chapter 2 considers drought in high latitude areas and Chapter 4 considers drought worldwide. Both chapters refer to these in their executive summaries.
23171	44	14	47	9	Evidences to strengthen the National Drought and Flood risks management policy. Eg whether a policy should allow subsidies in the event of catastrophic drought or allow tax holidays during drought years and which is payable during good rain years is key issue for sustainable development. Another example is about evidences on the cross border trading. For instance, the current year is droughty (famine year for Uganda during June-July-August-September, while the same season is predicted to experience good rainy season for bumper harvest in Ethiopia, so that Uganda can import seeds or grains from Ethiopia through cross border trading.. Yield forward selling i.e given the weather forecast information one year in advance and that third party is available to buy the products a year after, then smart farmers can allocate more land for the production of crop of interest the coming year. [Girma Diga, Ethiopia]	Rejected. No scientific evidence/ publication provided to support changes suggested by the reviewer. Financial implications covered in box on drought instruments in Chapter 3 and economic instruments in 7.5.3.5.
23173	44	14	47	9	From the supply side, policies on fertilizer distribution should be on the basis of downpayment (staggered) approach during the drought years or, if the payment should be made all at once, despite catastrophic drought is evident or not. This policy also includes whether payments could be cancelled at all, during catastrophic years [Girma Diga, Ethiopia]	Rejected. No scientific evidence/ publication provided to support changes suggested by the reviewer. Searches for fertilizer literature and drought instruments didn't reveal peer reviewed literature.
23175	44	14	47	9	Evidences on categorization of farmers into risk averse (who worry about the downside production risks) and risk takers (who worry about the upside production risks can help in transforming small scale farmers into commercial orientation, by effectively managing land-climate risks aiming at sustainable development [Girma Diga, Ethiopia]	Rejected. No scientific evidence/ publication provided to support changes suggested by the reviewer.
3745	44	14			Drought-related risk minimizing instruments? To better guide readers.... [Cordula Ott, Switzerland]	Copyedit to be completed prior to publication.
3747	44	34			Fire-related risk minimizing instruments [Cordula Ott, Switzerland]	Copyedit to be completed prior to publication.
22899	45	1	45	17	This section is extremely important and mentions very correctly the incentives that stimulate perverse behaviour as core to the problem. However, it is based on a rather small literature while on the topic of flood risk there is a very broad literature available. As this topic is of prime importance to risk management it would be good to better reflect the broader literature on this. [Anastasios Kentarchos, Belgium]	Accepted. Some literature added.
24327	45	2	45	2	Spatial planning does not necessarily imply a command-and-control approach but instead may involve cooperation as theorized by Burby, Raymond J. and Peter J. May. 2009. "Command of Cooperate: Rethinking Traditional Central Governments' Hazard Mitigation Policies." Pp. 21-33 in Building Safer Communities. Risk Governance, Spatial Planning, and Responses to Natural Hazards, edited by Urbano Fra.Paleo. Washington DC: IOS Press. [Urbano Fra.Paleo, Spain]	Accepted. This comment has been incorporated in the revisions.Cooperative local planning added
1983	45	14	45	14	Check use of parentheses [William Lahoz, Norway]	Thank you for the editing suggestion, which is being taken into account in the revisions.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
5617	45	30	45	30	"Measures in advance of events" what the author means by "measures"! [Sanaz Moghim, Iran]	Thank you. This comment has been incorporated in the revisions.
5619	45	31	45	32	"Without these,unsustainable", it is not clear! [Sanaz Moghim, Iran]	Thank you. This comment has been incorporated in the revisions.
40021	45	42	45	42	Bonds need not be high-yield. [, United States of America]	Thank you. This comment has been incorporated in the revisions.
40881	45		45		line 5 "governements need to' is prescriptive. [Valerie Masson-Delmotte, France]	Thank you. This comment has been incorporated in the revisions.
27347	45	18	47	9	It would improve the understanding of the section 7.5.3.5 if you could consider mentioning the same instruments in the classification part at the beginning (for instance, the second sentence) as in the following paragraphs with the detailed explanations (many of the instruments named at the beginning are not explained in the following and vice versa). [, Germany]	Thank you. This comment has been incorporated in the revisions.
40019	45	18	47	9	Section 7.5.3.5 deals with parametric insurance and should acknowledge that in the title. The discussion of ARC, CCRIF and PCRAFI should spell out these acronyms. This section is important and could perhaps be expanded slightly to elucidate some of the issues with household-level insurance. [, United States of America]	Thank you. This comment has been incorporated in the revisions.
3749	45	1			Flood-related risk minimizing instruments [Cordula Ott, Switzerland]	Copyedit to be completed prior to publication.
12331	45	18			Suggest to add a synthetic statement in this section about the available evidence and agreement on effectiveness of various economic instruments, [Hans Poertner and WGII TSU, Germany]	Noted. Literature on economic instruments all moved to 7.5.7. Where able, assessments of literature made.
27349	46	3	46	5	The expression "Green bond CAT bonds" is not clear: could you please reformulate? Do you mean "green CAT bonds" or do you want to refer to "green bonds" and "CAT bonds"? As "green CAT bonds" are very rare and the classification of the greenness of CAT bonds not evident, you might focus more on CAT bonds in general. [, Germany]	Thank you. This comment has been considered in the revisions.
27351	46	6	46	7	As green bonds, social impact bonds etc. have not explicitly been developed for the funding of land based interventions, you might exchange the verb by "... that can be used to fund land...". [, Germany]	Thank you. This comment has been considered in the revisions.
7201	46	8	46	13	Are there instruments that can be utilised to get developing countries to address some of these barriers? [Debra Roberts, South Africa]	Thank you. This comment has been considered in the revisions.
12333	46	14	46	23	Refer also to negative effects of insurance / maladaptation. See Müller, B., L. Johnson and D. Kreuer, 2017: Maladaptive outcomes of climate insurance in agriculture. Global Environmental Change, 46, 23-33, doi:10.1016/j.gloenvcha.2017.06.010. [Hans Poertner and WGII TSU, Germany]	Thank you. This comment has been incorporated in the revisions.
17965	46	18	46	20	India's National Agricultural Insurance Scheme is now known as Pradhan Mantri Fasal Bima Yojana (Prime Minister's Crop Insurance Scheme) and it was launched on 13th Feb 2016. It envisages a uniform premium of 2% to be paid by farmers for Kharif crops, and 1.5% for Rabi crops. The premium for annual commercial and horticulture crops is about 5%. [Nayanika Singh, India]	Thank you. This comment has been incorporated in the revisions.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
17967	46	19	46	20	".....one of the largest micro-insurance crop program but is heavily subsidized by Indian taxpayers (Mechler et al. 2006)." The reference by Mechler et al 2006 is not mentioned in the reference list at the end of this chapter. Also, 2006 reference in a report of 2019 seems dated. Agriculture sector and Agriculture Insurance Schemes across the world including in USA, China, Mexico etc are subsidized so it will useful to present a comprehensive global perspective on agriculture-based insurance. Furthermore, it is important to note that in India, agriculture is practiced mainly by small and marginal farmers who are vulnerable to the impacts of climate change. These farmers also donot have any other social security net. It is important to protect these farmers and their crops to address the problem of poverty as well as food security. [Nayanika Singh, India]	Thank you. This comment has been incorporated in the revisions.
7203	46	25	46	25	ARC should be written out in full on first usage. Drop both CCRIF, and PCRAFI as these acronyms are not used anywhere else in the chapter. [Debra Roberts, South Africa]	Thank you. This comment has been considered in the revisions and reference added.
21903	46	2		5	7.5.3.5.Economic instruments: Catastrophe bonds, contingency finance, forecast-based finance.. There is too much repetiotion of ideologies [Olusegun Adeaga, Nigeria]	Thank you. This comment has been considered in the revisions.
7205	47	9	47	9	Consider providing an assessment for this sub-section. [Debra Roberts, South Africa]	Noted. Where able assessments of literature have been made.
40025	47	13	47	13	It is not the Paris Agreement that reaffirms the target, but the accompanying UNFCCC COP decision that does so. The sentence should begin "UNFCCC DECISION 1/CP21 [DELETE: The Paris Agreement] reaffirmed the UNFCCC target that..." [, United States of America]	Accepted. Revised.
21635	47	13	47	24	A brief summary of findings from the SR15 is sorely missing here [Andy Reisinger, New Zealand]	Accepted. Revised.
21637	47	25	47	35	I don't mind this para as such (it doesn't seem to say anything wrong), but it is completely out of scope of the report. It would be far more relevant for this report to discuss whether certain agricultural subsidies result in inefficient food production than to discuss fossil fuel subsidies, or the extent to which removal of trade barriers could increase resiliende and reduce (or increase) greenhouse gas emissions from the land sector. [Andy Reisinger, New Zealand]	Rejected. The establishment of a consistent seamless carbon price across sectors without leakage advances climate mitigation and eases the entry point of agriculture as a sector in accounting for carbon. A previous review comment requested this insert as the existence of carbon subsidies reduces carbon pricing effectiveness.
1417	47	31	47	35	Consider to discuss uncertainty or at least use the conditional tense. [Sophie Szopa, France]	Accepted. Conditional language added.
1985	47	32	47	32	subsidies -> subsidies. [William Lahoz, Norway]	Accepted. Revised.
1987	47	33	47	33	Trillion of what? [William Lahoz, Norway]	Accepted. Revised.
15727	47	34	47	34	Delete "eleminate 55% of fossil fuel air pollution deaths" [, Iran]	Accepted. Revised.
40027	47	36	47	46	The framing of this paragarph suggests that legal instruments are an available and desired avenue for action on climate. This is not a universally shared proposition and therefore is not policy-neutral. The paragraph should be deleted. [, United States of America]	Rejected. Paragraph reworded to not suggest legal instruments are desired. However, legal action is a strategy employed by actors and a risk for actors.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
28871	47	40	47	46	In my opinion, this kind of "arrogant" approach that made nationalist like Trump to withdraw from Paris agreement! We can't force a country to adapt our vision of thinking to solve a challenging problem! In addition, poor countries should not be involved at the same level as the developed countries due the inequality in terms of readiness and awareness level. However, I was wondering why there is not project law against the 100 most polluting companies in the world which are responsible of 71% global GHG emissions!! I do believe that, the unique solution to climatic change and land degradation is green science and engineering by establishing specific academic programs (i.e Mechanical, chemical engineering more oriented to green technologies). Universities has the responsibility to form future generations to think green and rational, they are the unique hope to save earth from disaster. [Samir Hassani, Algeria]	Thank you for sharing this view during the review process. The literature assessment does not reflect particular individual reviews, yet the authors do appreciate and have made an effort in the revisions to ensure as much balance as the published literature allows.
40023	47	11	53	42	As the title suggests, most of the text in Section 7.5.4 is not specific to the land sector, and is out of scope of the report's topic. This section should be heavily pared back to focus on issues specific to the interaction of climate change and land-use and food security. In particular, the first two paragraphs of 7.5.4.2, 7.5.4.3, and the first four paragraphs of 7.5.4.4 are strong candidates for deletion. [, United States of America]	Thank you. This comment has been considered in the revisions.
12335	47	11			Several of the subsections under 7.5.4 a rather generic and should be more specific to land-related GHG mitigation policies. [Hans Poertner and WGII TSU, Germany]	Accepted. Section revised. Specific justification for referring to non land based carbon pricing instruments provided in text in relation to agricultural sector. Without the former, the probability of the latter reduces if not disappears.
27353	48	6	48	45	Please add a scientific assessment about the debate of shifting financial flows and Article 2.1.c of the Paris Agreement and its relevance for the respective sector. Please take into account the findings of the most recent Biennial Assessment of the Standing Committee of Finance. [, Germany]	Noted, however we are unable to add such an assessment due to space limitations. However, I have added some insights from this report
40029	48	6	48	45	The discussion of finance is unbalanced and heavily weighted toward public finance, which provides a small proportion of available finance in the agriculture and land-related sectors. The framing of international public finance as "provided" and the claim that "most developed countries tend to prefer allocating their funding to mitigation" are not consistent with developed country perspectives. The statement that mitigation finance "disregards the financing needs of vulnerable countries" reflects a value judgment inappropriate for an IPCC report. The end of the first paragraph cites the 1.5°C SR, then provides a 2017 source as the reference. [, United States of America]	Noted and amended
10435	48	7	48	7	Is this the cost of adaptation? Please specify. [Jean-Luc Chotte, France]	Specified
1989	48	10	48	10	I think it is "there", not capitalized. [William Lahoz, Norway]	accepted
27355	48	12	48	14	Section 7.5.4.2: The findings on climate finance are mainly based on literature from 2013. The authors are strongly encouraged to base the assessment on more recent information and literature. [, Germany]	More recent references have been added

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40031	48	13	48	14	The statement "...most developed countries tend to prefer allocating their funding to mitigation rather than adaptation actions (Abadie et al. 2013)" makes an unwarranted editorial assumption about the intention of developed countries as a whole. The ratios of mitigation and adaptation finance cited by Abadie et al. (2013) are now out of date. The statement oversimplifies actual circumstances by overlooking the facts that much finance is demand-driven, and that there may be more opportunities for mitigation finance than opportunities for adaptation finance for a variety of reasons. [, United States of America]	Accepted, this statement has been deleted
40033	48	13	48	22	The characterization that developed countries "prefer" to allocate financing to mitigation rather than adaptation doesn't take into account that challenges and often lack of available adaptation projects available for funding. This should be re-written to reflect the multivariate reasons why the majority of finance goes towards mitigation, and not frame this as a "preference". [, United States of America]	Accepted, we have removed the statement regarding a "preference" which is indeed misleading. Unfortunately we don't have space to explore the reasons why this is the case here.
27357	48	15	48	15	Please clarify the definition of climate finance as applied in that study, you may want to consider to add insights of the most recent SCF Biennial Assessment report. [, Germany]	This reference has been deleted
7207	48	20	48	20	SR1.5 should be the reference here not Hoch 2017. If the same point is made in Hoch 2017, then it should also be added in the in the first part of the sentence along SR1.5. [Debra Roberts, South Africa]	Accepted
10437	48	20	48	20	Change investment toward adaptation rather than mitigation? Please clarify. [Jean-Luc Chotte, France]	Clarified
27359	48	26	48	29	Please provide a scientific assessment of the most recent developments at the GCF such as on the start of the first replenishment process. [, Germany]	Unfortunately we are restricted in length and do not have the space to do this in detail - have added a sentence regarding the replenishment process
40035	48	34	48	34	Suggest replacing the words "global stocktake" with "review" to avoid confusion with the global stocktake mandated by Article 14 of the Paris Agreement, which has not yet taken place. [, United States of America]	Accepted
3751	48	44			The concept of ecosystem services is mentioned in several places throughout the Chapter.. but the concept (potential and dangers) stays unclear.. [Cordula Ott, Switzerland]	Noted, this section would not be the appropriate one to expand on the concept however.
27361	49	7	49	9	We suggest to slightly reformulate to improve the understanding: Do you want to say "... projects have a greater degree of independence than in the case of being funded by banks or institutions?" [, Germany]	Copyedit to be completed prior to publication.
1991	49	22	49	22	It is not clear to me what the "third" sector is. I suggest the authors provide a few words of explanation. [William Lahoz, Norway]	Added
27363	49	30	49	30	The name "polluter pays principle" is more common in literature. [, Germany]	Amended
40039	49	30	49	33	The first sentence of the section strongly suggests, without directly stating, that the carbon price should be based upon the social cost of carbon. Kaufman (2018) provides a detailed rationale for why the SCC does not provide a basis for an optimal carbon price path. Of course, one could also compare the SCC coming out of the DICE model versus the optimal price path out of the DICE model to arrive at the same conclusion and Kaufman cites a Nordhaus study that makes this point (http://www.nber.org/papers/w22933). https://energypolicy.columbia.edu/research/commentary/alternatives-social-cost-carbon-taxes-and-subsidies [, United States of America]	Thank you for the reference and comment. We have rephrased the sentence so that it no longer implies that Carbon pricing should be based on the SCC, and have added a peer-reviewed reference (Pezzey 2018).
40041	49	33	49	33	The Tol 2018 citation links to an erratum of a 2014 article. There are better sources to use. Perhaps the US National Academy of Science report from 2017. [, United States of America]	citation changed

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40043	49	36	49	38	Quantitative estimates of the efficiency of economy-wide versus sectoral policies are provided in Fawcett et al. (2014 Overview of EMF 24 Policy Scenarios https://web.stanford.edu/group/emf-research/docs/emf24/EMF_24.pdf). That citation seems appropriate here as supplement to the overview provided by Baranzini. [United States of America]	Thank you - useful analysis - added
40045	49	43	49	43	The sentence on a fuel tax needs to be placed into some context and should be discussed after a tax on emissions. There is a significant amount of literature on gasoline taxes that could be referenced here. It would also be worthwhile to note that factoring in the carbon content of the fuel is essential for efficient policies. [United States of America]	Deleted this sentence and changed the message of this paragraph
5621	49	43	49	43	General statement (globally) or for any specific region! [Sanaz Moghim, Iran]	Sentence removed
40047	49	43	49	46	The statement that "There is high agreement and medium evidence that a carbon tax, if designed properly, can reduce GHG emissions in multiple sectors with the advantage of environmental effectiveness at relatively low cost" is not supported by ANY of the references. Baranzani supports the point that emissions pricing is cost-effective RELATIVE TO OTHER INSTRUMENTS, but makes no claims about the overall costs of reductions. [United States of America]	Thank you - the statement has been removed and the paragraph revised
40049	49	43	49	48	The citation to Metcalf and Weisbach (2009) must be removed. This paragraph is a gross mischaracterization of the results of that M&W 2009 that leads one to question all of the other citations. The paper does not support the claims made. M&W 2009 discusses the point of regulation and implementation costs of covering, not reducing, 80% to 90% of emissions. Note the use of the word "cover", not reduce in the following sentence. "With respect to the base, we show that by collecting the tax upstream, we can accurately and cheaply cover 80 percent of U.S. emissions by taxing fewer than 3,000 taxpayers, and that we can cover close to 90 percent of U.S. emissions at a modest additional cost." [United States of America]	Thank you- the paragraph has been revised
40051	49	45	49	45	If the reports intends to quantify or compare the costs of emission reductions ("can reduce GHG emissions ... at relatively low cost"), it should cite the mitigation chapter of AR4 or the more recently published economic results from the 1.5°C SR. Both of these sources have multi-model ranges of the costs of emission reductions. If the point is to only compare the costs of price-based mechanisms to command and control, then this comment does not apply. [United States of America]	The point was regarding the comparison with command and control - but the paragraph has been revised in any case
40053	49	46	49	48	The following needs to be deleted: "One study identifies that a carbon tax in the United States could reduce a large proportion (between 80% and 90%) of emissions for a small additional cost (Metcalf and Weisbach 2009)." Metcalf and Weisbach 2009 discuss the administrative costs of implementing a tax on 80% to 90% of emissions. The paper does not examine the costs of mitigation. [United States of America]	Deleted this sentence and changed the message of this paragraph
5623	49	48	49	48	"for a small additional cost" can we quantify this small additional cost (any magnitude)? [Sanaz Moghim, Iran]	This sentence has been deleted
22901	49	29	50	45	This section on mitigation measures is of high importance and the review on carbon pricing of extreme importance as this is an often mentioned policy option. The findings of this review should be reflected in the executive summary [Anastasios Kentarchos, Belgium]	Accepted and amended

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
21641	49	29	50	45	The discussion in this section is very theoretical and contains lots of generalities e.g. about cap and trade systems, but completely ignores the fact that land-based emissions (other than forestry) are nowhere included in any cap and trade or tax scheme (other than on an opt-in basis). An assessment of the reasons for this (e.g. leakage, competitiveness, rural livelihoods and transitions), and ways to overcome barriers to taking agriculture more seriously and achieving more comprehensive mitigation measures that achieve the outcomes necessary to meet the objectives of the Paris Agreement, would add enormous value to this report. I would have expected a clear conclusion from this discussion that highlights that (a) currently, no country is exposing its agricultural emissions to carbon prices in any comprehensive way (either via price instruments or regulations that create substantial shadow prices), that (b) this means that the economic mitigation potential identified in chapter 5 and 6 will not be realised, and (c) that designing effective mitigation policies depends on advanced MRV systems which are currently sorely lacking in many developing countries (on the latter point, see e.g. Wilkes A, Reisinger A, Wollenberg E, van Dijk S. 2017. Measurement, reporting and verification of livestock GHG emissions by developing countries in the UNFCCC: current practices and opportunities for improvement. CCAFS Report No. 17. Wageningen, the Netherlands: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) and Global Research Alliance for Agricultural Greenhouse Gases (GRA). Also see resources on www.agmrv.org). [Andy Reisinger, New Zealand]	Accepted and amended, main points added
40037	49	29	50	45	The title of this section (Mitigation Instruments) jumps immediately into the discussion of carbon pricing without providing a broader perspective on the full stable of instruments (e.g., technology mandates, subsidies (to technologies or R&D), standards, voluntary initiatives, etc.). Given that these other instruments are already in place in all economies, a mix of price and non-price instruments will drive mitigation policy. Furthermore, the entire carbon pricing discussion in the first two paragraphs discusses the merits of price-based instruments relative to non-price instruments. The reader needs to know what non-price based alternatives the price instruments are being compared to. Additionally, Acemoglu et al. (2016) (https://economics.mit.edu/files/11668) finds that a combination of price-based mechanisms along with subsidies for R&D are better than price-based mechanisms alone. [United States of America]	Accepted
40055	49	48	50	3	It may be helpful to recast these sentences to describe the properties of an effective tax design. At a minimum, consider using the word "diminished" in place of "negated". Ineffective design is unlikely to entirely negate the effectiveness of a tax. [United States of America]	Thank you - the sentences have been revised according to your suggestions
26193	49	29	52	17	This section would benefit from a brief assessment of these various carbon pricing schemes in terms of their adaptability to providing incentives to landowners for carbon capture and storage in soils - potentially a very powerful stimulus to action but challenging to design, measure and verify. [Reid Detchon, United States of America]	Agreed this is important but we do not have sufficient space allocated to add this discussion
10439	50	4	50	4	Reword: cap and trade is just one type of carbon market; there is also the option of baseline and credit approach, such as the NSW Greenhouse Gas Abatement scheme, the first mandatory emissions trading scheme in the world. [Jean-Luc Chotte, France]	Added a clarification earlier in the text - but from our understanding the scheme is not mandatory.
40057	50	4	50	7	Cap and trade systems can also cover the entire economy -- that is, they are not limited to specific sectors or entities. [United States of America]	Amended

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27365	50	6	50	6	Cap & Trade schemes do not put a cap on a specific installation but provide a "capped" annual budget for all participants, e.g. a defined sector of the economy. Please revise. [, Germany]	This sentence has been deleted
40059	50	10	50	12	Cite the Schmalensee and Stavins (2017) review of 30 years of cap and trade systems across several sectors and regions (https://academic.oup.com/reep/article/11/1/59/3066276). [, United States of America]	Thank you, reference added
40061	50	17	50	18	The Scotchmer reference looks only at a stylized example in which a monopolist has rights to the only "clean" technology. There are more nuances to the merits of emission permits and taxes. See Newell (2010, Oxford Review of Economic Policy) for such a perspective, specifically page 259. https://dukespace.lib.duke.edu/dspace/bitstream/handle/10161/6751/NewellOxrep.pdf?sequence=1 [, United States of America]	Thank you, this paragraph has now been revised and this reference is no longer there
40063	50	23	50	24	This same criticism also applies to tax systems where the prices are different across regions, sectors, or political boundaries. This sentence should begin a new paragraph on leakage because leakage applies to both tax and cap and trade. [, United States of America]	Amended
40065	50	23	50	28	This section on leakage should cite EMF 29 by Bohringer et al. on Border Tax Adjustments. It contains the most complete discussion on the issues. https://www.sciencedirect.com/journal/energy-economics/vol/34/suppl/S2 [, United States of America]	Thank you, reference added
15391	50	29	50	31	Suggest rewording the sentence to "Australia's Emissions Reduction Fund, and the preceding Carbon Farming Initiative, have generated real and additional emission reductions (Verschuuren 2017) through projects avoiding emissions and sequestering emissions." The current wording suggests the CFI still exists and the ERF is part of it - which is not the case. [, Australia]	Thank you, amended
21639	50	29	50	34	Please state the estimated amount of reductions that this policy has generated (as a percentage of agricultural emissions). The key issue is that it is an opt-in policy, which means most farmers choose not to opt in and hence there is no mitigation signal at present. [Andy Reisinger, New Zealand]	Noted. Literature sought on this issue, but unable to locate in peer reviewed literature.
27367	50	29	50	34	This is an example of a "Baseline & Credit" scheme, often used complementary to "Cap & Trade" but also feasible as a stand-alone instrument. A short introduction to this kind of schemes should please be given. The most prominent implementation is the CDM under the Kyoto Protocol [, Germany]	Thank you, introduction added.
15395	50	30	50	30	Suggest correction to "Emissions Reduction Fund" (ie, no 's' on 'Reduction'). [, Australia]	Copyedit to be completed prior to publication.
10441	50	30	50	31	more accurately described as: ... for projects that reduce emissions or sequester carbon [Jean-Luc Chotte, France]	Amended
15393	50	31	50	34	Suggest re-wording this sentence to avoid misinterpretation. Verschuuren (2017) presents findings on aspects of Australia's Emissions Reduction Fund (ERF) that have been successful in delivering emissions reductions from the land sector. The paper also presents views on desirable design elements for carbon farming schemes more generally. The sentence as drafted conflates these different types of findings, and could misinform readers. The text could be made more informative and clear by separately drawing out the two types of findings. Authors may also wish to refer to findings of the Australian Climate Change Authority's 2017 review of the Emissions Reduction Fund, available at http://climatechangeauthority.gov.au/review-emissions-reduction-fund [, Australia]	Amended, thank you for the additional reference

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10443	50	31	50	34	as stated, this appears to say that the ERF has these features. In reality, this paper presents lessons from the ERF, and does not say that all these features apply to the current ERF scheme. [Jean-Luc Chotte, France]	Amended
27369	50	43	50	45	Non-market approaches do NOT include "ANY combination of measures or instruments related to adaptation, mitigation," etc., but rather only combinations which serve the enhancement of linkages and the creation of synergies between those instruments and the facilitation of their implementation and coordination via promoted ambition, enhanced participation in NDC implementation and enabled opportunities for coordination across instruments and institutional arrangements (cf. Art. 6.8 Paris Agreement and paragraphs 38 of decision 1/CP.21). In addition, please check the grammar of this sentence. [, Germany]	Sentence amended
21643	51	2	51	2	Agriculture does not account for a quarter of global emissions - AFOLU does. Not all FOLU emissions are driven by agriculture. [Andy Reisinger, New Zealand]	Revised
1993	51	11	51	12	Check use of parentheses. [William Lahoz, Norway]	Copyedit to be completed prior to publication.
10445	51	12	51	13	This is not correct. The Australian Emissions Reduction Fund scheme includes several methods for projects that reduce methane emissions from dairy and piggy manure, several for reducing enteric methane emissions from beef and dairy cattle, and one that reduces nitrous oxide from cotton by increasing nitrogen fertiliser use efficiency. see http://www.environment.gov.au/climate-change/government/emissions-reduction-fund/methods [Jean-Luc Chotte, France]	Thank you - but the text refers to trading schemes, and as far as I understand the AERF it is not a trading scheme.
21645	51	17	51	17	Unclear sentence construction - it is not clear which country the "is considering" refers to. [Andy Reisinger, New Zealand]	Sentence revised
21647	51	31	51	44	Free allocation is another and perhaps the most important issue, as this determines who actually bears the cost of mitigation. This should be flagged (and made clear that exposing farmers to the full cost of their emissions is unlikely in the near term as this would have very significant economic and social adjustment costs). [Andy Reisinger, New Zealand]	text reflecting this comment has been added
27371	52	42	52	42	The other key aims of the CDM should please be mentioned as well: assisting the Annex1 Parties in compliance with their emission reduction commitments and contributing to the sustainable development of the host Party. The complete name "Clean Development Mechanism" should be given. [, Germany]	Some elaboration has been provided for CDM aims.
1995	52	43	52	43	: I suggest the authors introduce the acronym for CDM. [William Lahoz, Norway]	Done.
21649	52	18			Note there is a glossary definition of technology transfer, please check that yours is consistent with this. [Andy Reisinger, New Zealand]	The text has been modified slightly in order to be consistent with the glossary definition
5625	53	12	53	14	"a tendency to rely on existing technologies rather than new or innovative technologies" in developing countries I agree but I believe it is not right generally. [Sanaz Moghim, Iran]	Agreed, this phrase has been removed.
28835	53	38	53	40	Suggested literature: Gupta, H., Dube, L.C., 2018. Addressing biodiversity in climate change discourse: Paris mechanisms hold more promise. International Forestry Review 20, 104–114. https://doi.org/10.1505/146554818822824282 [Lokesh Chandra Dube, India]	Reference has been added.
5627	53	43	53	44	"includes the avoidance of double counting of emissions" needs to be re-written [Sanaz Moghim, Iran]	Agreed, and changed to be consistent with Article 6.2 of the Paris Agreement.

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27373	53	25	54	40	It is unclear how most of these descriptions of the mechanisms of the Paris Agreement relate to technology transfer; most content would be more appropriately reflected under mitigation instruments in section 7.5.4.4 above, which already duplicates some of the content. Please revise. [, Germany]	The IPCC definition of Technology Transfer is used here; as it is fairly broad, including knowledge transfer and international cooperation, the material here is related to technology transfer. Also, technology transfer can be for adaptation as well as mitigation. A new sub-section (7.5.4.6) has been added and merged with the overlapping material as suggested by the reviewer.
25693	54	1	54	39	All these paragraphs about Article 6 of the Paris Agreement should be the subject of a dedicated section, separate from technology transfers, which are covered by Article 10 of the Paris Agreement. [, France]	New sub-section 7.5.4.6 added.
27375	54	14	54	16	The current formulation "Achieving readiness also requires the transfer of capacities, as well as technologies to developing country Parties, such as advanced remote sensing technologies that help to reduce uncertainty in the monitoring of forests (Goetz et al. 2015)." is policy prescriptive - please revise. [, Germany]	Agreed, wording is changed as suggested by the Reviewer.
29715	54	17	54	28	An important challenge relevant here is how to improve the accuracy of reported emissions and removals and to verify mitigation actions related to land use, in order to be able to assess progress towards the goal of balancing emissions and removals (Paris Agreement article 4.1) and to track progress towards the NDCs. [, Saint Lucia]	A reference has been added in relation to the issue raised; as it relates to mitigation.
27377	54	20	54	20	Proposal for a more appropriate wording " ..., but reductions shall not be double-counted..." instead of "..., but reductions cannot be double-counted" , because there is the clear obligation for all participating parties to avoid any kind of double-counting, which answers to a clear risk of double (or even multiple) counting. [, Germany]	Agreed and changed.
25729	54	23	54	26	This has been settled by the adoption of the PA rulebook at COP24. Both decisions on mitigation and transparency retained 2006 IPCC guidelines as the ones used for GHG inventories and NDC accounting. [, France]	This updated information has been added.
27379	54	23	54	26	Please update taking into account the implementation rules for transparency agreed in Katowice, https://unfccc.int/sites/default/files/resource/I23_0.pdf , which now clarifies in paragraph 20 and 50 that the 2006 IPCC Guidelines and any subsequent version agreed by the CMA shall be used also for LULUCF and that the use of the 2013 Supplement on Wetlands is encouraged. Paragraph 22 provides for nationally appropriate methodologies, consistent with the IPCC guidelines. Paragraph 35 provides that IPCC AR5 (or later, as agreed) metrics and GWP 100 values shall be used. Using these methodologies and metrics as a basis for the methodologies and MRV for (market) mechanisms as well would enable the implementation of the long-standing principle "a ton is a ton", without any complex conversion rates for transfers which would otherwise be necessary. [, Germany]	This updated information has been added, with reference to the PA rulebook.
25731	54	26	54	28	The paper cited below gives a much lower uncertainty. A range, instead of a figure should be given here. Benveniste, H., Boucher, O., Guivarch, C., Le Treut, H., & Criqui, P. (2018). Impacts of nationally determined contributions on 2030 global greenhouse gas emissions: uncertainty analysis and distribution of emissions. Environmental Research Letters, 13(1), 014022. [, France]	Reference is added; however, it is difficult to give a range as the article only looks at those countries that have indicated specific targets and notes that uncertainty would be higher when including all countries.
10447	54	38	54	39	not clear what will be considered on case-by-case basis, and backed by strong safeguards. [Jean-Luc Chotte, France]	This has been clarified/corrected

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28461	54	41	54	41	LDN is not a policy responding to desertification (land degradation in drylands) alone, but all land degradation. This should read "7.5.5 Policies Responding to Land Degradation – Land Degradation Neutrality (LDN) [Barron Joseph Orr, Germany]	Good points, Not only desertification, but also other types of LDN were addressed.
28463	54	41	56	43	The pursuit LDN in countries is growing rapidly, and the science behind it is expanding. We recommend this section be updated to reflect that literature. For example: https://doi.org/10.1016/j.envsci.2018.09.022 ; https://doi.org/10.1016/j.envsci.2018.11.017 ; https://doi.org/10.1016/j.envsci.2018.12.019 ; https://www.sciencedirect.com/science/article/pii/S1462901118305768 [Barron Joseph Orr, Germany]	The recommended literature were reflected.
40067	54	41	56	43	This section should be pared back to ensure consistency with the report's agreed scope and edited to improve syntax. The discussion of Land Degradation Neutrality is highly confusing and appears to misrepresent the cited decision of UNCCD COP12 (decision 3). Much of the discussion is focused on land degradation as distinct from climate change; such a lengthy discussion does not belong in a report on climate change, unless links are clearly made in the text. [United States of America]	The UNCCD cited part were deleted and this section addressed climate change mainly.
3753	54	41			as Land Degradation Neutrality comes up in other Chapters (for example 1 and 3), a link to this chapter is helpful [Cordula Ott, Switzerland]	LDN parts is shorten and linked to earlier chapters
12337	54	41			Is LDN only relevant for drylands, or why is it separated under policies responding to desertification? This seems to imply that it is not applicable for other degradation processes. [Hans Poertner and WGII TSU, Germany]	Not only desertification, but also other types of LDN were addressed.
28459	55	9	55	10	this implies that LDN will be assessed on global basis; in fact, LDN commitments are made, and must be achieved, at national level. Furthermore, the LDN conceptual framework (Cowie et al, 2018) specifies that counterbalancing losses and gains should occur within each land type, that is, neutrality should be achieved for each land type. [Barron Joseph Orr, Germany]	Noted
10449	55	9	55	10	this implies that LDN will be assessed on global basis; in fact, LDN commitments are made, and must be achieved, at national level. Furthermore, the LDN conceptual framework (Cowie et al, 2018) specifies that counterbalancing losses and gains should occur within each land type, that is, neutrality should be achieved for each land type. [Jean-Luc Chotte, France]	Noted
10451	55	18	55	24	This is hard to follow. Emphasise the response hierarchy (avoid - reduce - reverse) and the importance of SLM. [Jean-Luc Chotte, France]	This part was rewritten and address the response hierarchy.
32347	55	43	55	43	SDGs [Sofie Linder, Sweden]	For individual goal, SDG is appropriate since it is singular.
25757	56	1	56	6	land neutrality can be supported by policies addressing comments 2,4,6,7,8 and 9. [Roque Pedace, Argentina]	The comments are not clear
10453	56	3	56	3	"Furthermore" is more appropriate than "However". This is complementary, not contradictory. [Jean-Luc Chotte, France]	Thanks! It was changed followed by the comments

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28465	56	6	56	7	Text needs to be added to this section to reflect the fact that the scientific conceptual framework for land degradation neutrality has been endorsed by all 197 Parties to the UNCCD. The citations for the framework itself are: Orr, B.J., A.L. Cowie, V.M. Castillo Sanchez, P. Chasek, N.D. Crossman, A. Erlewein, G. Louwagie, M. Maron, G.I. Metternicht, S. Minelli, A.E. Tengberg, S. Walter, and S. Welton. 2017. Scientific Conceptual Framework for Land Degradation Neutrality. A Report of the Science-Policy Interface. United Nations Convention to Combat Desertification (UNCCD), Bonn, Germany. and Cowie, A.L., B.J. Orr, V.M. Castillo Sanchez, P. Chasek, N.D. Crossman, A. Erlewein, G. Louwagie, M. Maron, G.I. Metternicht, S. Minelli, A.E. Tengberg, S. Walter, and S. Welton. 2018. Land in balance: The scientific conceptual framework for Land Degradation Neutrality. Environmental Science & Policy 79:25-35. doi: 10.1016/j.envsci.2017.10.011 . The COP decision is located in this citation: UNCCD, 2017. Report of the conference of the parties on its thirteenth session, held in Ordos, China, from 6 to 16 september 2017. Part Two: Action Taken by the Conference of the Parties at Its Thirteenth Session. ICCD/COP(13)/21/Add.1. https://www.unccd.int/sites/default/files/sessions/documents/2017-11/cop21add1_eng.pdf . This process as well as the status of the LDN target setting program and the experience of countries is documented in: Chasek, P, M. Akhtar-Schuster, B.J. Orr, A. Luise, H. Rakoto Ratsimba and U. Safriel. 2019. Land degradation neutrality: The science-policy interface from the UNCCD to national implementation. Environmental Science & Policy 92:182-190. doi: 10.1016/j.envsci.2018.11.017 [Barron Joseph Orr, Germany]	Thanks for the comments. However, explanation on LDN need to be shortened since chapter 7 is not focusing LDN.
10455	56	11	56	11	Note that the LDN conceptual framework and UNCCD target setting program do not use the term offset. Rather, we refer to counterbalancing, to avoid the impression that it is acceptable to pay others while continuing to degrade land. [Jean-Luc Chotte, France]	Thanks for the comment! It was addressed by replacing offset with counterbalancing.
10457	56	21	56	21	I think you mean land degradation not LDN. [Jean-Luc Chotte, France]	Thanks! Corrected.
5629	56	23	56	24	"limited national and international scientific capacities to measure desertification and challenges related to" better to rewrite it! [Sanaz Moghim, Iran]	The sentence was rewritten.
5631	56	28	56	29	"components of land systems and their mutual equilibrium" needs to be clear! [Sanaz Moghim, Iran]	The sentence was deleted
10459	56	35	56	37	Explain the basis for the risk of failure, and provide references to support. Are you thinking about climate change impacts reducing effectiveness of revegetation measures and interventions to build soil carbon, for example? [Jean-Luc Chotte, France]	Supportive sentence with references were inserted.
10461	56	39	56	39	not clear - is this referring to the geographically-limited mandate of the UNCCD? Note that the GEF provides financial support for developing countries to pursue LDN, under GEF7. [Jean-Luc Chotte, France]	The sentence was revised to be more clear
21905	56	33		43	7.5.5.Policies responding to Desertification. Please recast. [Olusegun Adeaga, Nigeria]	This section is reorganized and revised overall.
25695	57	2	57	2	The difference between land-use zoning and land-use planning should be explained, if any. The issue of ecological connectivity, in view of climate adaptation, should also be highlighted. [France]	Land use zoning differentiated; land use planning covered in 7.7.2; Ecological connectivity expanded in this section.

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25697	57	2	57	2	Only one reference is used in this paragraph, we suggest to add more. Some more references: - Anguelovski, Isabelle, et al. "Equity impacts of urban land use planning for climate adaptation: Critical perspectives from the global north and south." <i>Journal of Planning Education and Research</i> 36.3 (2016): 333-348. - Schmitz, Oswald J., et al. "Conserving biodiversity: practical guidance about climate change adaptation approaches in support of land-use planning." <i>Natural Areas Journal</i> 35.1 (2015): 190-203. - Berke, Philip R., and Mark R. Stevens. "Land use planning for climate adaptation: Theory and practice." <i>Journal of Planning Education and Research</i> 36.3 (2016): 283-289. - Ford, Alistair, et al. "Land-use transport models for climate change mitigation and adaptation planning." <i>Journal of Transport and Land Use</i> 11.1 (2018). [, France]	Accepted. Berk, Schmitz, Jepson and Anguelovski added here. Ford added in 7.7.2.
10463	57	10	57	10	not in reference list. Perhaps you mean Metternicht? (also not in reference list) [Jean-Luc Chotte, France]	Accepted. Reference revised.
25699	57	11	57	11	In particular in order to be consistent with Chapter 6, elements should also be given about <u>Nature's Contributions to People (NCP)</u> . [, France]	Accepted. Reference to chapter 6 an Nature's contribution to people made.
22903	57	11	57	41	The section on conserving biodiversity mostly reports measures similar to those discussed in Ch 6 (ecosystem-based adaptation is discussed similarly in Ch 6). This should not be unnecessarily repeated in this chapter. What is needed is to discuss what policy options are available to stimulate/initiate ecosystem-based adaptation. [Anastasios Kentarchos, Belgium]	Accepted. Section rewritten to focus on policy.
5633	57	12	57	13	the strong statement needs references [Sanaz Moghim, Iran]	Accepted. Section and statement revised.
40069	57	42	57	46	This statement is probably too definitive, and should be supported by a source. [, United States of America]	Accepted. Statement deleted.
10465	57	46	57	49	I think you mean its recognition by decision-makers is limited [Jean-Luc Chotte, France]	Accepted and revised.
21907	57	31		41	7.5.6.2 Please recast [Olusegun Adeaga, Nigeria]	Accepted. This section has been rewritten.
25701	58	5	58	8	There is nothing in the decision 1/CP.21 neither in the Paris Agreement about this. Where does this come from? [, France]	Accepted. This sentence has been deleted.
10467	58	11	58	13	sentence very hard to follow. Please reword. [Jean-Luc Chotte, France]	Accepted. this section has been rewritten.
25703	58	21	58	21	It would be useful to add a paragraph on zero deforestation commitments in this section, and on the certifications that could result from them. In France, the national strategy to combat imported deforestation (SNDI) has thus introduced the idea of a zero deforestation label. See GENERAL COMMENT ON SUPPLY CHAIN SUSTAINABILITY MANAGEMENT. [, France]	Agreed, these references have been added
40071	58	21	58	35	Need sources for this discussion. [, United States of America]	sources have been added
10469	58	31	58	35	The most relevant standard to the topic of this section is ISO 13065:2015 Sustainability criteria for bioenergy. Also relevant to this report, and this chapter in particular, are the adaptation standards under development ISO 14090 Adaptation to climate change -- Principles, requirements and guidelines and ISO 14091 Adaptation to climate change -- Vulnerability, impacts and risk assessment. While the documents themselves cannot be referenced, it would be appropriate to mention that they will soon be available. [Jean-Luc Chotte, France]	The report assess the literature so a future standard is not within scope, but the standard for adaptation might be relevant for sections and has been passed on to other sections of this chapter.
10471	58	36	58	41	There is a hint here, but make it clearer that it is possible to find land use options that enable biomass production to complement other land uses. [Jean-Luc Chotte, France]	This information has been added and is also reflected in the cross-chapter box on Bioenergy and BECCS.
22905	58	8			Land degradation neutrality is introduced here while in the preceding section (7.5.5) already all attention to LDN is given. This needs to be made more consistent [Anastasios Kentarchos, Belgium]	Accepted. LDN deleted here.

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32901	58	21			Booth, M. (2018). Not carbon neutral: assessing the net emissions impact of residues burned for bioenergy. Environmental Research Letters 13 035001 [Doreen Stabinsky, United States of America]	This reference is about accounting not certification and so has been passed on to Chapter 2 for consideration.
10473	59	1	59	1	Typo: PEFC, and what do the letters refer to? [assume this is Programme for the Endorsement of Forest Certification (PEFC)] [Jean-Luc Chotte, France]	This has been changed.
1997	59	1	59	1	To aid the reader, indicate in the caption to Table 7.3 what a tick signifies. [William Lahoz, Norway]	This has been done.
22907	60	1	60	7	This is an important section as certification schemes are already an important tool. Evidence on impacts outside plantations is mentioned. However, the large literature and debate on effectiveness (and tradeoffs) on-site needs more discussion. It is of extreme importance that such measures that are reasonably well studied are properly synthesized to enhance learning from these experiences and assess the potential for up- or outscaling [Anastasios Kentarchos, Belgium]	Agreed, we have added references on assessing effectiveness. The results are generally not conclusive and are somewhat context-specific however, and we have also mentioned this as a knowledge gap.
12339	60	1	60	7	The focus of the assessment here regarding the standards and certification should be on climate change adaptation/mitigation and not sustainability in general. [Hans Poertner and WGII TSU, Germany]	Agreed, we have removed aspects that are not "directly" linked to climate change and land.
10475	60	5	60	7	Point not clear: do you mean there is low evidence, low agreement on whether these schemes have enhanced sustainability, rather than how? Provide some indication of the issues - is it leakage? Why do you consider only outside the farm? It is also relevant to discuss the success or otherwise of these schemes in enhancing sustainability of production. [Jean-Luc Chotte, France]	Noted. Section has been revised.
10477	60	9	60	21	Include WOCAT (https://www.wocat.net/en/) [Jean-Luc Chotte, France]	This has been added.
27381	60	38	60	40	The studies cited refer to the European biofuel policies and the renewable energy targets set in the Renewable energy directive (see next paragraph). The sustainability criteria laid down in the RED, however, are valid for all biofuel feedstocks. The limitation to sugar cane, soya and palm oil here, is thus not justified. Please adjust accordingly. [, Germany]	Agreed, this point has been generalised.
32633	60	44	60	49	Page 7-60, lines 44-49: These lines claim that the EU RED criteria in effect go beyond standard carbon accounting and make EU bioenergy users responsible for emissions beyond its borders. Like other lifecycle analyses, that is true for the "production emissions," e.g., the emissions from fossil fuel used in the harvest of wood or production of wood pellets. However, the primary effect of the RED is the opposite. Under the EU RED, bioenergy is treated as carbon neutral in that the emissions from burning biomass do not count. This assumption would and could only be valid if these emissions were offset by additional plant growth or reduced decomposition in the forest from which the wood is harvested – and such additional plant growth or reduced decomposition must occur because of bioenergy and must therefore not count any plant growth that would occur anyway. Moreover, nothing in the RED requires that biomass be offset in this way. In addition, arguments that the RED is focused on long-term carbon stocks are precluded by the fact that the same law requires in general that carbon balanced from forest clearing for liquid biofuels be based on net emissions after 20 years. Far from taking responsibility for out of region emissions, the primary effect of the RED is therefore to take credit for offsets through forest management that (a) are not required and (b) would occur outside the EU. (This is fully explained in the main text and supplement for (Timothy D. Searchinger, Tim Beringer, Daniel M. Kammen, Eric F. Lambin, Wolfgang Lucht, Peter Raven, Jean-Pascal van Ypersele 2018) [Timothy Searchinger, United States of America]	The reviewer's point lies outside the scope of this section, which focuses only on certification and standards in relation to land and biomass use. This section is not concerned with assessing the EU-RED or with carbon accounting for biomass and land more generally. The reviewer's point on accounting is taken up instead in the cross-chapter Box on Bioenergy and BECCS.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
27383	60	52	60	53	The revised RED (Dez 11 2018; https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1546858127470&uri=CELEX:32018L2001) for the period from 2020-2030 also sets sustainability criteria for biomass fuels used for electricity and heat production - but only for biomass fuels used in large installations. The "extending responsibility" mentioned below was thus expanded to other crops and to the forest. Nevertheless, the scope is still very limited. The need to address all bioenergy used and to consider also indirect effects should be further stressed in this paragraph. [, Germany]	Have added reference to the new RED. However, there is no literature to assess as the legislation was passed in December 2018.
23545	60	43			The range of formal and informal decision-making applications is wide. Formal decision-making needs to increase the scope of its use as much as possible, reducing the cost of use. Informal decisions require as much accuracy as p [Huai Jianjun, China]	This pertains to a different section and has been passed on to them.
24329	61	1	61	1	Energy security goes beyond access and the nexus approach addresses the close relationships between food, water and energy security, as the section points out. Energy access should be replaced by energy security. Sovacool, Benjamin K., and Marilyn A. Brown. 2011. Conceptualizing and measuring energy security: A synthesized approach. <i>Energy</i> 36 (8):5343-5355. Golam Rasul & Bikash Sharma (2016) The nexus approach to water–energy–food security: an option for adaptation to climate change, <i>Climate Policy</i> , 16:6, 682-702, DOI: 10.1080/14693062.2015.1029865 [Urbano Fra.Paleo, Spain]	Rejected; this section deals with energy access rather than energy security (see Glossary for distinction) because energy access has significant land, climate and development implications of high relevance for this report, whereas energy security has more relevance for national energy supply policies and governance.
21705	61	1	61	20	The discussion of REDD+ seems based on an idealized interpretation of how it is meant to work, but in fact the examples given are more the exception rather than the rule: REDD+ is a valid policy framework, but it has changed in practice from what was originally proposed, and is facing all kinds of problems of political access, opportunity cost versus other land uses, and a lack of buy-in from local people. The current text makes no mention of these challenges, which makes the current text appear very old fashioned and rather idealistic. [Timothy Forsyth, United Kingdom (of Great Britain and Northern Ireland)]	Revised text to address these concerns.
10479	61	1	61	34	include cross-reference to the box on traditional biomass [Jean-Luc Chotte, France]	Accepted, this has been added.
40073	61	9	61	12	The indoor air mortality estimate could cite more recent sources (e.g., the most recent <i>Global Burden of Disease report</i>). [, United States of America]	Accepted; later source has been added.
32349	61	13	61	13	SDGs [Sofie Linder, Sweden]	Accepted, corrected
25705	61	36	61	36	Some very recent references should be used to update the analyses of this case study: - Correa, Juliano, Richard van der Hoff, and Raoni Rajão. "Results-based conservation aid: Amazon Fund 10 2 years later, lessons from the world's largest REDD+ 3 program 4." (2018). - Murthy, Indu K., et al. "Experience of Participatory Forest Management in India: Lessons for Governance and Institutional Arrangements Under REDD+." <i>Global Forest Governance and Climate Change</i> . Palgrave Macmillan, Cham, 2018. 175-201. - Angelsen, A., et al. "Transforming REDD+: Lessons and new directions." (2018) CIFOR. [, France]	Accepted: Murthy et al and Angelsen et al have been included. Note, that Correa et al has not been published in a peer review format yet and has not been included.
12341	61	37	61	39	Avoid blurry term 'real' incorporation/participation. What does that 'really' mean? [Hans Poertner and WGII TSU, Germany]	Accepted: corrected

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
15211	61	36	62	13	The Case Studies err in several aspects. 1. The Amazon component is entirely incoherent because it conflates issues related to (a) one or more voluntary market REDD+ projects, (b) REDD+ programs at state (e.g. REM in the state of Acre) or regional-level (e.g. Amazon Fund), and c) REDD+ policies at international, national, and subnational levels. The India component displays a misunderstanding of the "EFT", which is calculated based on a one-time estimate of forest cover prior to policy implementation, hence does not incentivize ongoing protection. Also, the final paragraph of this section is a run-on diatribe, albeit well-meaning, but based as much on conjecture as evidence. [Daniel Zarin, United States of America]	Accepted: In the Amazon section, a paragraph has been created to address the comment and guide the reading about the multi-scale problem. In the India section we have revised the text to give correct interpretation of EFT. Last paragraph has been revised.
17969	62	12	62	25	The paragraph is based on single source reference and needs to be substantiated. [Nayanika Singh, India]	Revised and references added
23745	62	14	62	14	Forest Conservation Act (1980) corrected to Forest (Conservation) Act, 1980 [India]	Corrected
5635	62	26	62	34	any reference for this part! [Sanaz Moghim, Iran]	Reference added
7209	62	30	62	30	Boserup 1970 is quite an old citation. Consider replacing this with a more recent citation. [Debra Roberts, South Africa]	Accepted. Reference has been replaced
7211	62	31	62	33	Perhaps, consider providing the global picture before drilling down to regional differences? [Debra Roberts, South Africa]	Accepted. There is a new introduction paragraph
23751	62	35	62	36	Replace the sentence with the following text: "As per FRA, the forest rights and occupation in forest land for forest dwelling Scheduled Tribes and other traditional forest dwellers have been recognised". [India]	Accepted: it has been revised
17509	62	37	62	37	Better to use only "REDD+" instead of "REDD", as in the rest of the document, to avoid questions of whether the use of different acronyms was intentional (and given that REDD and REDD+ are often interpreted slightly differently) [Dirk Nemitz, Germany]	Accepted. It has been revised
23749	62	37	62	37	"REDD or" to be deleted as REDD has been replaced by REDD+ or REDD-plus [India]	Accepted: it has been revised
17971	62	39	62	40	The sentence ".....Green India Mission that aims to create an additional carbon sink of 2.5 to 3 billion tonnes of CO2 equivalent by 2030." is incorrect. This is one of the 8 NDCs submitted by India to UNFCCC and not that of Green India Mission which is one of the 8 missions under India's NAPCC. [Nayanika Singh, India]	Text revised and corrected
23747	62	45	62	45	Followig may be added 'In 2014, India's [14th] finance commission' [India]	Added
40883	62		62		cross chapter coordination needed on Amazon / Brazil and India forests [Valerie Masson-Delmotte, France]	Accepted. There has been a review of SOD to achieve complementarity. Text has been reviewed
29859	62	16	63	13	The information related to forest diversion in India, NPV and CAMPA and the issue of Forest Right Act 2006 narrated in this section is incomplete and misleading and the relation fo the FRA 2006 to REDD+ is somewhat convulating. Before 2006 when the Forest Rights Act was enacted forest diversion for development projects leading to deforestation needed the forest clearance from the Central Government under the provisions of the Forest Conservation Act 1980. To regulate forest diversion and as payment for ecosystem services payment of Net Present Value (NPV) was introduced by the Supreme Court of India following the recommendations of the Report of the NPV Committee headed by Dr. Kanchan Chopra. The Supreme Court established the Compensatory Afforestation Management and Planning Authority (CAMPA) under which the fund collected for compensatory afforestation and on account of NPV from project developers is deposited. The CAMPA was in function since 2002. [Souparna Lahiri, India]	Revised accordingly

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
29965	62	16	63	13	The Forest Conservation Act of 1980 does require compensatory afforestation in lieu of forest diversion. To that was added the payment of NPV to get the forest clearance for diversion. The Indian Parliament passed the Forest Rights Act in 2006 and was enacted in 2008. Since 2009, and as per the provisions of the FRA 2006, the condition of consent and approval of the Village Community Collective/Village Council called Gram Sabha was made mandatory for forest clearance for diversion for non forest purpose. Now, getting back to NPV and CAMPA, the main recommendation of the NPV Committee on sharing and use of the offset CAMPA fund was that 50% of the fund should go to the local governance institution and the rest 50% to be shared between the centre and state/federal governments. This recommendation was not made operational and the entire offset fund went to the use by both the centre and the states instead of sharing with the Gram Sabha, the local governance institution in the forests. Though Gram Sabha, is recognised by the Forest Rights Act as an institution of forest governance by the community and plays central role in managing forests, its protection and conservation, taking the role of the forest departments, successive governments, the Ministry of Environment, Forests and Climate Change and the forest bureaucracy have deliberately failed to recognise and let the Gram Sabha play its role in future forest governance. The CAMPA fund disbursement related CAF Act does not recognise the rights of the forest communities and the Gram Sabha in planning, consultation and decision making process of compensatory afforestation or the Green India Programme (a REDD+ scheme). The REDD+ readiness programme also avoids to recognise the central role of the Gram Sabhas in forest governance, community rights of governance and over forest resources. If the Forest Rights Act 2006 is fully implemented in the forests of India, one does not need REDD+ programme at all to avoid deforestation. The Gram Sabha and the communities with their secured tenurial rights and rights over resources with the responsibility to manage forests will perform much better than the forest departments and the Ministry to stop deforestation and increase forest cover, carbon stock and enhance sink. The information that FRA 2006 is creating problem for REDD+ as compensatory afforestation cannot be done on rights holders land is misleading and incorrect. Rather the REDD+ programme should have consulted the communities, rightsholders and the Gram Sabha, ideally. [Souparna Lahiri, India]	This section has been completely revised and all suggested edits made
3755	62	30		31	This is often forgotten! Rurality as a source.. not only a question of incentives: but income.. smallholders must sufficiently be paid for their production [Cordula Ott, Switzerland]	Accepted. Text already reflect the comment
6521	63	16	63	20	The 4 pillars of food Security could be better introduced. Currently, the sentence may be wrongly interpreted as saying that the key aspect of food security is food availability, including a list of other elements (diversity, access, etc). It could be useful to remind where those 4 pillars come from and to phrase is at the 4 of them are equally important. [Sara Lickel, France]	Thank you. This comment has been taken into account in the revisions.
40075	63	27	63	29	What is meant by "general services" in agriculture and what is the implied point of this sentence? Is R&D included in general services (e.g., is 14% low)? Consider rephrasing. [, United States of America]	Thank you. This comment has been considered and clarified in the revisions.
5637	63	27	63	29	is it on average, for global! Any reference! [Sanaz Moghim, Iran]	Thank you. This comment has been considered and clarified in the revisions.
6523	63	32	63	40	this part is crucial, it should stay in the final version and be considered for the SPM. [Sara Lickel, France]	Thank you. This comment has been considered and clarified in the revisions.
40077	63	33	63	34	This statement appears to reflect a value judgment on the actions of smallholder farmers. [, United States of America]	Thank you. This comment has been considered and clarified in the revisions.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
32573	63	42	63	44	"Agricultural technology transfer can help optimize food and nutrition security. Policies that affect agricultural innovation span sectors and include "macro-economic policy-settings; institutional governance; environmental standards; investment, land, labor and education policies; and incentives for investment, such as a predictable regulatory environment and robust intellectual property rights" ---where is the reference for the text under quote? [Neeraja Havaligi, United States of America]	Thank you. This comment has been considered and clarified in the revisions.
40885	63		63		education could be mentioned in ES / SPM. Gap in knowledge better placed in final section of chapter rather than disseminated. [Valerie Masson-Delmotte, France]	Thank you. This comment has been suggested for the chapter ES, and SPM in section C.
32575	64	4	64	6	Additional references required to strengthen the claims made in this text "Participatory platforms (such as co-design for scenario planning) can build 5 social and human capital while improving understanding of food system risks and creating innovative 6 ways for collectively planning for more equitable and resilient food system (Himanen et al. 2016)." [Neeraja Havaligi, United States of America]	Rejected. No confidence statement made.
32577	64	12	64	14	"New evidence indicates that a government policy supporting 13 producer subsidy could encourage farmers to adopt new technology and reduce GHG reductions in 14 agriculture (medium evidence, high agreement)." Studies such Feder and Umali (1993) have shown that the impact of policy interventions to promote technology adoption 'depends on the type of technology, market structure, and the nature and duration of the policy intervention'. The adoption of agricultural innovations: A review. Gershon Feder, Dina L.Umali. Technological Forecasting and Social Change. Volume 43, Issues 3-4, May-June 1993, Pages 215-239. [Neeraja Havaligi, United States of America]	Thank you. Additional references added.
32351	64	30	64	30	SDGs [Sofie Linder, Sweden]	Reviewer suggestion is not apparent.
593	64	36	64	36	Hilmi N., Allemand D., Kavanagh C., Laffoley D., Metian M., Osborn D., Reynaud S. (eds.) (2015). Bridging the Gap Between Ocean Acidification Impacts and Economic Valuation: Regional Impacts of Ocean Acidification on Fisheries and Aquaculture. G land, Switzerland: IUCN. 136 pages. ISBN: 978-2-8317-1723-4. DOI: 10.2305/IUCN.CH.2015.03.en [Nathalie Hilmi, France]	Reviewer suggestion is not apparent.
21909	64	19		36	7.5.7 policies for food security.Recast [Olusegun Adeaga, Nigeria]	Reviewer suggestion is not apparent.
3757	64	37		39	again: increase income is important, It is also a question of just prices [Cordula Ott, Switzerland]	Rejected. Valuation is concept considered in literature revised.
3759	64	45			Is universal basic income already a policy instrument? [Cordula Ott, Switzerland]	Noted. Yes considered a policy instrument
40079	65	7	65	18	This discussion doesn't effectively get at the interesting questions. Have the policies discussed been effective? Why would a tax reduce agricultural production? Suggest either deleting it or expanding it to provide appropriate detail for an assessment. [, United States of America]	"accepted" discussion has been deepened. Where literature on policy instrument effectiveness exists it has been added. Revisions have been made on tax.
1999	65	9	65	11	I understand the Denmark tax on saturated fat content failed. If correct, I suggest the authors comment on this. [William Lahoz, Norway]	Rejected.
6525	65	14	65	18	The authors could add a mention to show the importance of accompanying climate measure by social and fair measures, so that the burden is not carried by the poorest. [Sara Lickel, France]	Noted.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
32579	65	21	65	25	Please address the other side of economic growth and increased consumption of high protein and fat based diets. For example, "economic development has led to improved food security and better health, adverse health effects of the nutrition transition include growing rates of childhood obesity" (Drewnowski and Popkin, 1997). Speedy 2003 points out that 'although there is a great rise in global livestock production, the pattern of consumption is very uneven' and that 'the main determinant of per capita meat consumption appears to be wealth' References: The Nutrition Transition: New Trends in the Global Diet. Adam Drewnowski Ph.D Barry M. Popkin Ph.D. Nutrition Reviews, Volume55, Issue2, February 1997, Pages 31-43 Global Production and Consumption of Animal Source Foods. Andrew W. Speedy. The Journal of Nutrition, Volume 133, Issue 11, 1 November 2003, Pages 4048S–4053S. [Neeraja Havalig], United States of America]	Noted. Beyond the scope of this chapter and better covered in chapter 5.
595	65	28	65	28	Policy mix: this term is used for the combination of fiscal and monetary policies at macroeconomic level. [Nathalie Hilmi, France]	Accepted. Revised to 'portfolio'
22909	65	28	66	45	Policy mix coherence is argued for as essential for policy effectiveness. Unfortunately the section remains at a highly theoretical level (e.g.: "studying policy mixes allows for consideration of policy coherence" etc). A synthesis of the literature of succesful (and failing) poicy mixes and an attempt to base recommendations on these would be extremely useful and a way to makle the chapter recommendations more specific and actionable [Anastasios Kentarchos, Belgium]	Accepted. This section was revised to be a summation of the sections previously as well as new literature on policy mix, porttfolio and coherence
27385	65	19			Please mention less animal-based diets, and avoid using words like "healthy" which might have different interpretations in different cultures. Please see also our comment on the Entire Report. [, Germany]	Noted.
27387	65	22			Please refer to the gender dimension of education, also in the Box in Gender later in this chapter. [, Germany]	Rejected. Outside the scope of the chapter.
23537	65	38			The adaptive management in the real world natural resource management still has incomplete realization. The reason can be given more explanation from the research in other fields, not necessarily in the scope of natural resources. [Huai Jianjun, China]	Accepted. However, the research of AM in other fields has been included in 7.6.4 the section specifically on adaptive management.
10481	66	2	66	5	cite also the GEF publication Bierbaum, R. et al. 2018. Integration: to solve complex environmental problems. Scientific and Technical Advisory Panel to the Global Environment Facility. Washington, DC. http://stapef.org/sites/default/files/publications/STAP%20Report%20on%20integration.PDF [Jean-Luc Chotte, France]	Accepted. Literature added.
33577	66	17	66	22	the research sould investigate far beyond the only food production systems, in order to construct efficient adaptative repsonsos. Miller & al. 2013 : Critical research needs for successful food systems adaptation to climate change. Journal of Agriculture, Food Systems, and Community Development. In addition, a better anticipation of usage conflicts over resources, including food, could modify social preferences towards lands managements including climate mitigation and adapatation recommenadations. [Nicolas Siorak, France]	Noted. Chapter 5 thoroughly covers food systems. Space prevents thorough coverage in chapter 7.
40081	66	41	66	45	This text is not specific to the land sector and should be deleted. [, United States of America]	Accepted. Deleted.
12343	67	3	67	5	It is not clear if this is a statement that is as generic as it sounds, or if there is such evidence also specifically for land-related policies as discussed above. [Hans Poertner and WGII TSU, Germany]	Accepted. Revised to refer specifically to land based policies.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
40083	67	3	67	10	Section 7.5.9.1 begins with a series of sweeping and prescriptive claims. The paragraph should be revised to present the material in a neutral and evidence-based way. [United States of America]	Rejected. This finding is consistent with the SPM of SREX in C paragraph four and section 7.5.2 above. Prescriptive language revised.
13097	67	12	67	12	If possible, and space permits, impacts of gender and age should also be included (adolescent boys and girls, impacts linked to school, men and women of advanced age). [Kristi Tabaj, United States of America]	Noted but space didn't permit the addition as box was reduced.
5639	67	21	67	21	"negative impacts" on what! [Sanaz Moghim, Iran]	Accepted. Revised to negative impacts of climate change.
12345	67	30	67	30	A reference from 1970 is not adequate as evidence for this statement. [Hans Poertner and WGII TSU, Germany]	Accepted. Revised and updated.
13095	67	31	67	33	Please refer to Myth #2 within Doss, Meinzen-Dick, Quisumbing, and Thies, 2018 as it may help to refine and further strengthen the text: https://www.sciencedirect.com/science/article/pii/S2211912417300779?via%3Dihub [Kristi Tabaj, United States of America]	Accepted and added
7213	67	36	67	38	Since the problem of land ownership is more prevalent in developing countries, it will be useful to indicate what proportion of the less than 20% of female land owners are from developing countries [Debra Roberts, South Africa]	Accepted and added
7215	67	38	67	40	Are all these developing countries? [Debra Roberts, South Africa]	Accepted but deleted due to space.
7217	67	43	67	44	It might be useful to provide the proportion as in the case of Bangladesh and Nigeria. [Debra Roberts, South Africa]	Accepted and added
40887	67		69		while there is a x chapter box on gender, gender info is too disseminated in various sections of all chapters which do not refer to this box. This is to be improved by e.g. having a map of gender issues in ch 1 and this box to convey key findings from assessments done in various chapters, with a summary used to convey conclusions to ES, and cross references to other chapters. Avoid prescriptive tone "should focus" [Valerie Masson-Delmotte, France]	Accepted. An attempt to coordinate the chapters that refer to gender is made here. Chapter 1 introduces ideas of gender and vulnerability.
40085	67	12	71	2	Cross-Chapter Box 6 is well-written, relevant to the topic, and draws extensively on evidence. This would be a good model for other authors to use in considering how to present material in an IPCC report. The box is perhaps a bit too long, however. Candidates for deletion include: p. 68 lines 23-27, p. 69 lines 22-24, and p. 70 lines 4-10 and 21 to end. It would also be helpful to avoid terms like "intersectional" which sound jargon-y to many who are not specifically focused on gender studies. Also, it seems that the box could consider potential synergies, such as benefits of climate-smart agriculture approaches that could increase the incomes and agency of women farmers, or the benefits of sustainable livelihoods associated with REDD+ programs for women. There are likely many examples of these programs available through aid agencies, if not in the academic literature. Suggest also looking at the Forest Investment Program (FIP) to see how it is handling these issues. [United States of America]	Rejected. Thank you for the compliment. Cross chapter boxes are allowed 12 IPCC Pages (1 page 950 words). Intersectionality moved up to frame the literature assessed in relation to gender. REDD+ policies were added but due to space, reduced. Grey literature, not peer reviewed literature found on FIP.
25755	67	12	71	2	box on gender .see comment 1. [Roque Pedace, Argentina]	Rejected. Outside the scope of the chapter.
27389	67	1	74	36	Please consider adding a paragraph on key barriers to implement land based adaptation and mitigation, and sustainable land management options as well as options to overcome these barriers based on section 7.5.9. to the ES and SPM's section D. [Germany]	Accepted. Added to ES and SPM.
27391	67	1	74	37	We strongly urge the authors to add a subsection on "Barriers to Mitigation and options to overcome these barriers" to section 7.5.9. in order to provide a comprehensive and balanced assessment. [Germany]	Accepted.
21651	67	1			Section 7.5.9 includes a section on barriers to adaptation - why not a section on barriers to mitigation? This would be extremely useful, especially when coupled with the observation that mitigation (of ag emissions) is currently almost non-existent beyond co-benefits. [Andy Reisinger, New Zealand]	Accepted. Barriers to mitigation added.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
3763	67	2		11	Inequality comprises many issues (wealth, knowledge, access to resources and power... etc.) Age and gender and spatial distribution etc are factor.. this paragraph is a bit short on inequalities, although the Box on gender inequalities sis good [Cordula Ott, Switzerland]	Accepted and revised.
27393	67	12			We strongly urge the authors to revise this box: - Please provide a balanced consideration of adaptation, mitigation and SLM. - Do not describe women as a homogeneous group. While there is one para in this box that states that such generalization is not appropriate, the rest of the discussion in the box applies such a generalizing presentation. - "women are not a homogeneous group": Why should more than half of the human population be homogeneous? Please reconsider this statement. - Please refer to the role of women in fostering mitigation actions though education and cultural and socio/economic systems that are a key barrier to the implementation of SLM approaches. - Why are drought effects gender-specific? Please explain. - This finding on "the lack of substantive references and commitments in the NDCs to women and gender" is counterintuitive as NDCs are nationally determined, and there is a gender framework in the UNFCCC - please explain. [, Germany]	Accepted. The following changes have been made: added some literature on mitigation; addressed wherever relevant the difference between women and gender; revised the wording to indicate the necessary balance between acknowledging diversity amongst women (heterogeneity) and ongoing trends of gender inequality that disproportionately affect women.
3761	67	28			all the paragraphs about gender/women issues could be compared once and it could be thought about where to include what.. [Cordula Ott, Switzerland]	Noted. This section has been revised to include intersectionality at the forefront and then have these paragraphs on the gender differences in relation to land (the topic of this report)
22911	69	1	69	45	while this box is useful and provides a good overview of genered issues related to land it would, in the context of chapter 7, be good to also list (based on review of literature) the policy options available to achieve the mentioned goals [Anastasios Kentarchos, Belgium]	Accepted. Policy options are added.
17511	69	27	69	29	The text on "global forest carbon markets" is completely misleading, as this implies that such a market exists. Currently, this is clearly not the case. The IPCC SR shall not prejudge whether such markets will or will not be established in the future. Suggest to delete the phrase "Global forest carbon markets to" (and change "incentivise" to "incentivising"). [Dirk Nemitz, Germany]	Gender box revised and this is removed.
5641	69	39	69	42	I am not convinced why this statement is for women, it is valid for both men and women! [Sanaz Moghim, Iran]	Accepted and revised. Have now referred to families rather than only women
5643	69	47	69	48	can we say "women ... homogenous group"! [Sanaz Moghim, Iran]	Accepted and revised.
32353	70	22	70	22	NDCs [Sofie Linder, Sweden]	Copyedit to be completed prior to publication.
5645	70	35	70	36	probably here we need to highlight the main role of awareness raising! [Sanaz Moghim, Iran]	Accepted and revised.
5647	70	40	70	40	"inequality" in what! [Sanaz Moghim, Iran]	Wordings revised
5649	70	42	70	47	long sentence, which is hard to follow and get the point! [Sanaz Moghim, Iran]	Thank you. This suggestion has been taken into account during the revisions process.
5651	71	9	71	12	this part needs to be re-written [Sanaz Moghim, Iran]	This paragraph has been rewritten
2001	71	15	71	15	I suggest an increase in the font of the text in Fig. 7.6. [William Lahoz, Norway]	Thank you. This formatting suggestion has been taken into account during the revisions process.
5653	71	16	71	29	this part is not written correctly [Sanaz Moghim, Iran]	Thank you. This suggestion has been taken into account during the revisions process.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
31777	71	3	72	6	The section of "Adaptation limits and barriers" has been revised and written well, in particular in terms of covering the main limits and barriers. However, in terms of freshwater scarcity, the severe water scarcity and shortages in arid and semi-arid regions can be mentioned as another supporting example in addition to the Mekennen and Hoekstra (2016) . [Alaa Al-Hasani, Iraq]	In order to ensure relevance to the chapter themes of policy responses, we have had to exclude coverage of hard limits to adaptation
3765	71	4	73	3	Resilience is an important concept that is linked to adaptation, but is not taken up here. It comes up late, in 7.7.1 [Cordula Ott, Switzerland]	We have considered this point but feel the sequence in which we introduce concepts in the chapter is robust
29717	71	4			This section on barriers to adaptation should also include more information on hard limits to adaptation that have already been experienced on land, and how further limits will be exceeded at higher levels of warming. What options are available for dealing with hard limits? [, Saint Lucia]	In order to ensure relevance to the chapter themes of policy responses, we have had to exclude coverage of hard limits to adaptation
21911	71	16		19	7.5.9.2 Barriers to adaptation. Recast [Olusegun Adeaga, Nigeria]	Comment unclear. Not clear what the reviewer means by "recast"?
7219	72	12	72	12	What is the assessment 'high agreement, medium evidence' linked to? The table? What is being assessed is not explicit as currently expressed. [Debra Roberts, South Africa]	Thank you. This suggestion has been taken into account particularly in 7.3.2 during the revisions process.
22913	72	15	72	16	The table needs more references to show the diversity of literature on these issues. It would also be good to add a column providing examples (supported by a reference) of this to make all less theoretical [Anastasios Kentarchos, Belgium]	The sentence has been slightly rewritten, and we feel the confidence assessment is clear. Some new references have been added. Inserting a new column would have increased the space taken up by the table
29719	72	15	72	16	This table on soft limits to adaptation is a useful addition to the report, but it does not sufficiently cover financial barriers (e.g. lack of domestic funds, inability to access international funds) [, Saint Lucia]	Accepted and amended.
40889	72		72		Table 7.4 is very generic. What is specific for this report? Implications of these limits for residual risks (and loss and damage)? [Valerie Masson-Delmotte, France]	Rejected. Beyond the scope of the chapter
23547	72	39			Partly related to the dynamic changes of vulnerability, the content of multi-risk assessment can be used for analysis, using multiple exposures and multiple vulnerabilities. [Huai Jianjun, China]	We cannot trace the sentence this comment refers to - p. 72 has only 31 lines of text
7673	73	5	73	26	There is another reference that would broaden the issues discussed here to include disciplinary practices that create barriers to adaptation. Lawrence, J., Sullivan, F., Lash, A., Ide, G., Cameron, C., McGlinchey, L., 2015. Adapting to changing climate risk by local government in New Zealand: institutional practice barriers and enablers. Local Environment 20, 298-320. [Judy Lawrence, New Zealand]	Thank you , but this sub-section has been deleted
12347	73	15	73	23	These examples could be more specific to the land challenges [Hans Poertner and WGII TSU, Germany]	This sub-section has been deleted
24331	73	28	73	28	food-water-energy nexus [Urbano Fra.Paleo, Spain]	This sub-section has been deleted
5655	73	31	73	34	what does this part want to say! [Sanaz Moghim, Iran]	This sub-section has been deleted
6527	74	5	74	8	this part should be considered for the SPM [Sara Lickel, France]	Thank you, we are confident similar ideas will be introduced into the SPM by other chapters
10483	74	8	74	11	this list seems to include continuing current practice - how can that improve productivity and sustainability? [Jean-Luc Chotte, France]	Rejected, we do not see a contradiction between supporting the best elements of current practice and increasing productivity and sustainability
10485	74	15	74	15	traditional farming is already included above - how is this additional? [Jean-Luc Chotte, France]	Accepted and amended

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
33575	74	15	74	28	Because of climate inertia, human stressors on ecosystems could increase. For instance, redistribution of fish species and drops of catchments could reinforce the overexploitation of fish stocks by fishermen, in order to maintain their financial or food resources. The current context of these previsible impacts is already unstable, as nearly 90% of the world's marine fish stocks are now fully exploited, overexploited or depleted. FAO 2018, State of fisheries and aquaculture. [Nicolas Siorak, France]	Thank you for sharing this view. We are not clear of the relevance of this comment to the "Overcoming barriers" sub-section, especially as in order to ensure relevance to the chapter themes of policy responses, we have had to exclude coverage of hard limits to adaptation
5657	74	29	74	31	can not follow it! [Sanaz Moghim, Iran]	rejected. reviewers have specifically asked to address overcoming barriers. Incremental and transformational adaptation is an important part of the literature.
10487	74	29	74	32	this last phrase seems to be the wrong way around. Noble did not say this. [Jean-Luc Chotte, France]	rejected. reviewers have specifically asked to address overcoming barriers. Incremental and transformational adaptation is an important part of the literature.
40087	74	29	74	36	The discussion of transformational and incremental adaptation is confusing. Are these concepts presented correctly? [, United States of America]	rejected. reviewers have specifically asked to address overcoming barriers. Incremental and transformational adaptation is an important part of the literature.
12349	74	29	74	36	This paragraph is too conceptual/generic and repetition of AR5. Suggest to be specific regarding the land challenges. [Hans Poertner and WGII TSU, Germany]	rejected. reviewers have specifically asked to address overcoming barriers. Incremental and transformational adaptation is an important part of the literature.
32355	74	41	74	41	in the NDCs, with [Sofie Linder, Sweden]	Copyedit to be completed prior to publication.
40089	74	39	75	4	There are several prescriptive statements here that should be revised to present the material more neutrally. [, United States of America]	Accepted. Section rewritten to address prescriptive statements
29861	74	39	77	34	This section which deals with formal and so called informal institutions and their interactions in decision making is really inadequate and devoid of rich array of references to so called informal institutions or traditional institutions of governance and decision making in land and forests that are available. Fifty percent of forest land, today, is under traditional land use of which barely 20% are formally recognised through legal or legislative support and policy. These so called informal institutions, the traditional institutions of indigenous and local forest communities, their governance systems and role, their property rights framework have to be recognised and strengthened through secured tenurial rights and collective rights over forest resources for improved decision making in climate change and land and local climate actions through community governed and controlled forest management systems. Today's sustainable forest management, unfortunately does not recognise the role of the community and leaves the management to the State and its agencies which has consistently seen forests as part of revenue generation and of late, in the climate change debate, as an offset to balance emissions from other sectors. The formal institutions of the modern State have to recognise these traditional institutions, their central role and that of the communities for better decision making and actions related to climate change and land. [Souparna Lahiri, India]	Accepted. Informal institutions and forestry added.
22915	74	38	80	30	This section reads like an academic text book explaining different modes of decision making. The theoretical stands can be strongly shortened while more attention should be given an concrete decision-making options for dealing with climate change, synthesizing experiences and evidence across the literature. [Anastasios Kentarchos, Belgium]	Accepted. This section has been revised to draw out the main decision making tools , processes, and examples (7.6.4).
27395	74	38	80	30	Section 7.6 has a bias towards adaptation. We consider it essential the authors to extend their assessment to address the lack of implementing mitigation actions in this section in more detail and thank you in advance for your efforts provide this information. [, Germany]	Accepted - we have extended the section to incorporate appropriate mitigation tools and decision-making processes as well.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
23549	74	6			Trade-offs and synergies are a relatively new theoretical concept that can be adopted in many aspects of risk assessment. Taking measures to reduce vulnerability in one aspect may increase vulnerability on the other hand. These issues require researchers to weigh, see what solutions are needed, and how to balance this correlation between individuals. [Huai Jianjun, China]	We do not see the relevance of this comment to the particular passage commented on
7675	75	7	75	10	Key references are missing here and in the examples given that follow for the more recent work in this areas. Haasnoot et al 2013; Lawrence, J., et al., National guidance for adapting to coastal hazards and sea level rise: Anticipating change, when and how to change pathway. Environmental Science & Policy, 2018. 82(https://doi.org/10.1016/j.envsci.2018.01.012): p. 100-107. Lawrence, J. and M. Haasnoot, What it took to catalyse uptake of dynamic adaptive pathways planning to address climate change uncertainty. Environmental Science & Policy, 2017. 68: p. 47-57. Bloemen, P., M. Van Der Steen, and Z. Van Der Wal, Designing a century ahead: climate change adaptation in the Dutch Delta. Policy and Society, 2018: p. 1-19. Barnett, J., et al., A local coastal adaptation pathway. Nature Climate Change, 2014. 4: p. 1103–1108. Lawrence J., R. Bell, and A. Stroombergen, A hybrid process to address uncertainty and changing climate risk in coastal areas using Dynamic Adaptive Pathways Planning, Multi-Criteria Decision Analysis & Real Options Analysis. Sustainability, 2019. Special Issue Policy Pathways for Sustainability(accepted in press); Walker, W., M. Haasnoot, and J. Kwakkel, Adapt or perish: A review of planning approaches for adaptation under deep uncertainty. Sustainability 2013. 5: p. 955-979. Haasnoot, M., S. van 't Klooster, and J. van Alphen, Designing a monitoring system to detect signals to adapt to uncertain climate change. Global Environmental Change, 2018. 52: p. 273-285. Haasnoot, M., et al., Dynamic adaptive policy pathways: A method for crafting robust decisions for a deeply uncertain world. Global Environmental Change, 2013. 23(2): p. 485-498. Stephens, S., R. Bell, and J. Lawrence, Applying Principles of Uncertainty within Coastal Hazard Assessments to Better Support Coastal Adaptation. Marine Sciences and Engineering, 2017. 5(40): p. 20. Stephens, S., R. Bell, and J. Lawrence, Developing signals to trigger adaptation to sea-level rise. Environmental Research Letters, 2018. 13(10): p. 104004. [Judy Lawrence, New Zealand]	Accepted. A selection of recent references added and references also considered for upcoming sections of the chapter.
5659	75	22	75	23	it needs reference! [Sanaz Moghim, Iran]	Accepted. References to the upcoming sections added.
24811	75	23	75	24	The sentence should specify "what and where in the chapter" are these emerging approaches, in the subsequent sections the reader doesn't see the emerging approaches clearly. [Justice Issah Musah Surugu, Germany]	Accepted. References to the upcoming dsections added.
24813	75	26	75	45	Consider deleting these lines / section 7.6.1 (formal and informal decision making) because it is a repetition of subsections of the same section. Consider just adding one or two sentences to introduce the section. [Justice Issah Musah Surugu, Germany]	Accepted and paragraphs reduced.
12351	75	27	75	45	Suggest to cut these rather generic introductory paragraphs. The relevant assessment is done in the following sections. [Hans Poertner and WGII TSU, Germany]	Accepted and paragraphs reduced.
40091	75	17	76	20	This text is not specific to the land sector and should be deleted. [, United States of America]	Rejected. Text in lines 14-16 deleted relating to hydro dams deleted. 17-20 relates to decision making and uncertainty.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
12353	76	31			This section seems to deal only with the role of informal institutions in the global south. What about the evidence of informal institutions in the global north? [Hans Poertner and WGII TSU, Germany]	Accepted. Reference added to make clear section also applies in global north.
1533	77	36	81	4	This subchapter overestimates the role of uncertainty in non-decisionmaking, and therefore should broaden its perspective on why (climate) policymaking tends to be inconsistent and not strictly evidence based. This doesn't mean that uncertainty isn't a problem, but to acknowledge that uncertainty is very often used by policymakers as an excuse for inappropriate action. There are many "procedural"/"institutional" reasons stemming from political/bureaucratic structures and policymaking processes why there are huge inconsistencies between (climate) policy talk, decisions, and actions, including strategic stakeholder management, political competition, institutional inertia, time constraints and limited capacities to process information and - specifically relevant in long-term policymaking - fluid participation and shifting preferences. There is vast social science literature on this, for example Cairney 2016 (The Politics of Evidence-Based Policymaking, Palgrave Macmillan), Geden 2016 (WIREs Clim. Change 7, 790-797); Howlett 2014 (Glob. Environ. Change 29, 395-403); Munck and Rosenschöld et al. 2014 (WIREs Clim. Change 5, 639-648), Brunsson 2007 (The Consequences of Decision-Making, Oxford University Press) [Oliver Geden, Germany]	Agree, the intention was not to suggest that uncertainty could be used as an excuse for inappropriate action. A sentence has been added to indicate this. The wider issues referred to here are beyond the scope of this section on decision-making tools however - the references may be useful in other sections and have forwarded to appropriate authors.
21653	77	36			Section 7.6.2 seems to focus on decision-making and risk mainly from a climate change impacts and adaptation perspective, and contains very little on decision-making and risk dimensions from a mitigation perspective. This imbalance should be addressed. [Andy Reisinger, New Zealand]	Accepted. Mitigation added to section 7.6 and 7.7
12355	77	36			This section mixes new conceptual findings with applied decision-making and rarely with examples. This should more clearly indicate: Assessment of conceptual literature, and actual empirical evidence. [Hans Poertner and WGII TSU, Germany]	Accepted. Introduction to section explains section as indicated.
27397	77	37			"Decision Making Tools" do not seem to be addressed in this section, please check. [Germany]	Accepted. Tool of cost benefit analysis identified and this section merged with the second.
7567	78	1	78	9	Add SLR as a specific example, with time scale of centuries if not millennia until realized but locked-in much earlier (within decades); Solomon S., et al. (2009) Irreversible climate change due to carbon dioxide emissions, PROC. NATL. ACAD. SCI. USA 106(6):1704-1709, 1707, 1708 ("Anthropogenic carbon dioxide will cause irrevocable sea level rise.... An assessed range of models suggests that the eventual contribution to sea level rise from thermal expansion of the ocean is expected to be 0.2-0.6 m per degree of global warming (5). Fig. 4 uses this range together with a best estimate for climate sensitivity of 3 °C (5) to estimate lower limits to eventual sea level rise due to thermal expansion alone. Fig. 4 shows that even with zero emissions after reaching a peak concentration, irreversible global average sea level rise of at least 0.4-1.0 m is expected if 21st century CO2 concentrations exceed 600 ppmv and as much as 1.9 m for a peak CO2 concentration exceeding 1,000 ppmv."). [Durwood Zaelke, United States of America]	Accepted and added.
7643	78	1	78	9	Add SLR as a specific example, with time scale of centuries if not millennia until realized but locked-in much earlier (within decades); Solomon S., et al. (2009) Irreversible climate change due to carbon dioxide emissions, PROC. NATL. ACAD. SCI. 106(6):1704-1709, 1707. [Kristin Campbell, United States of America]	Accepted and added.
24341	78	3	78	4	by combining proactive and reactive approaches [Urbano Fra.Paleo, Spain]	Accepted and revised.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
10489	78	22	78	26	this misrepresents the VRK framework, which actually focuses on "interactions among societal values, institutional rules and scientific and experiential knowledge about biophysical impacts of climate change and adaptation options" (Prober et al, 2017). [Jean-Luc Chotte, France]	These sentences have now been deleted
24335	78	23	78	26	however they act in a context that puts some constraints to decision-making, particularly because the present is shaped by the past, path dependence, whereby there are ordinary processes inherited from the past (transferred) and vested interests of key stakeholders or societal actors that seek to satisfy their own individual or group needs. Thus the TNK (transfer, needs, knowledge) framework completes the picture provided by the VRK framework Fra Paleo, U. 2009. On exposure to natural hazards. Revisiting a neglected primal action. In Building safer communities. Risk governance, spatial planning and responses to natural hazards. U. Fra (ed.). Amsterdam: IOS Press. pp. 61-87. [Urbano Fra.Paleo, Spain]	Noted. Section has been revised.
7677	78	28	78	28	Lawrence, J., Bell, R., Blackett, P., Stephens, S., Allan, S., 2018. National guidance for adapting to coastal hazards and sea level rise: Anticipating change, when and how to change pathway. Environmental Science & Policy 82, 100-107. Add at the end of this para the following text supported by the reference here. " These elements have been embodied in national coastal hazards and climate change guidance for decision makers in New Zealand and are now being applied in other domains of interest including the land and water sectors (Lawrence et al 2018) [Judy Lawrence, New Zealand]	Thank you - but we have a section on adaptation pathways later on. This particular paragraph has been changed so the reference would no longer be suitable here
3767	78	10	80	29	was wondering why not a next paragraph take up more complex structured problems... There is a correlation between the complexity of problems('moderately to complex to chaotic' structured problems) and an increasing need to integrate civil society along that line... i.e. In more complex issues, more normative decision-making is necessary... (also could be integrated in the Figure 7.7) [Cordula Ott, Switzerland]	Accepted. Reference to structured problems added.
14769	79	1	79	12	Regime shift appears again here. It would be useful to discuss the concepts here as well particularly with respect to just transition. [Laxmi Pant, Canada]	This is beyond the scope of this section, and the word limit of the chapter
10491	79	10	79	12	This sentence seems out of place (not clear how construction is relevant to land use and managing land degradation?) under and inaccurate - implying that multi-criteria decision-making is exclusively applicable to construction. Delete. [Jean-Luc Chotte, France]	Accepted - sentence rephrased to focus on MCDA for the land sector
7679	79	12	79	12	Lawrence J., R. Bell, and A. Stroombergen, A hybrid process to address uncertainty and changing climate risk in coastal areas using Dynamic Adaptive Pathways Planning, Multi-Criteria Decision Analysis & Real Options Analysis. Sustainability, 2019. Special Issue Policy Pathways for Sustainability(accepted in press); Add this ref with the following text. Combining Dynamic Adaptive Pathways and Real Options Analysis with Multi Criteria Decision Analysis has enabled changing risk over time to be included in assessment of adaptation options through a participatory learning process. (Lawrence et al 2019 accepted in press. This ref will be published this week. [Judy Lawrence, New Zealand]	A version of this suggested sentence has been added further in the section
12653	79	18	79	19	The sentence refers to robust decision making in the face of deep uncertainty and refers to Box 7.2. However Box 7.2 on page 36 to 37 is on ENSO, Emerging Risks and Sustainable Land Management. Robust methods is only briefly referred to on page 37 line 18, with two references. Suggest that some further explanation or literature is required on these approaches. [Zelina Binti Zaiton Ibrahim, Malaysia]	Cross-reference error corrected. We have some further explanation of RDM is provided in the following paragraph - we are constrained with space and not able to add much more discussion

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
12655	79	20	79	21	Three main approaches Real Options Analysis, Portfolio Analysis, and Robust Decision-Making. A useful figure (figure 7.7, on page 81, line 1) is presented, showing the range of methods used. I suggest that this discussion be placed before Policy Response to Rick as a policy response is expected to be after decision making process is carried out [Zelina Binti Zaiton Ibrahim, Malaysia]	Rejected. Policy instruments explained, decision making, and then governance. Movement from information, decisions, to higher level governance for the flow of the chapter.
2003	79	34	79	45	I suggest the authors consider discussing the work of Kahneman (on behavioural economics). [William Lahoz, Norway]	While Kahneman is a key figure in behavioural economics, his work is not directly applied to the land sector
23539	79	16			Resilience is the core concept of adaptive governance. It should expand all aspects of livelihood, such as farmer resilience, corporate resilience, regional resilience, etc., and more discussion is needed in conjunction with resilience-related research. [Huai Jianjun, China]	This is true however we are very constrained for space and cannot introduce much new material at this stage in this section which is about decision-making tools
27399	80	26	80	29	This statement comes as a surprise and should be further elaborated please because much of current climate policy is based exactly such combinations. Please explain. [Germany]	Noted but rejected. Peer reviewed literature supporting reviewers' assertion that this is how policy is made required.
40093	81	1	81	1	This figure is not readable. [United States of America]	Copyedit to be completed prior to publication.
2005	81	1	81	1	I suggest the authors increase the font of the text in Fig.7.7. [William Lahoz, Norway]	Copyedit to be completed prior to publication.
5661	81	16	81	16	"adoption versus adaptation of measures" is it right! [Sanaz Moghim, Iran]	Accepted and revised.
7681	81		81		Figure 7.7 could be constructed in a clearer way. It is somewhat hard to follow even by experts. The types of assessment tools don't line up well as drawn. Also many of the decision tools can be used together and finding a way to depict that would be helpful. The sense making text in the figure also applies to RDM and DAPP and scenario analysis is used with DAPP to stress test options. The idea of the Figure is good but needs some more work for it to convey meaning better, There is a table in a report by Watkiss that may work better. the economic tools are also discussed in the Climatic Change paper. ? Watkiss, P. and A. Hunt, Method overview: Decision support methods for adaptation. Briefing Note 1. Summary of methods and case study examples from the MEDIATION Project. Available from: http://www.mediation-project.eu/platform/pbs/pdf/Briefing-Note-1-LR.pdf . 2013. Watkiss, P., et al., The use of new economic decision support tools for adaptation assessment: A review of methods and applications, towards guidance on applicability. Climatic Change, 2015. 132: p. 401-416. [Judy Lawrence, New Zealand]	Accepted. Figure has been revised to be clearer. Uncertainty and decision making space is point of the figure.
40893	81		81		explain how best practices are identified in the literature. [Valerie Masson-Delmotte, France]	Accepted. Identification in the literature added.
32987	82	1	102	46	I found it confusing as a reader that there were sections both on 'adaptive management' (from page 7-82) and also 'adaptive governance responding to uncertainty' (from page 7-92). These two chapter sections do not seem to be well distinguished from each other, especially because the former deals extensively with management under uncertainty. I would strongly recommend that you consolidate and streamline these two sections into one. [Mairi Dupar, United Kingdom (of Great Britain and Northern Ireland)]	Rejected. Sections not consolidated as management and governance are different concepts. The definition of governance is in the glossary and introduced in 7.2 as well as expanded on in 7.7.
21655	82	5			Should there be a section that discusses options for policy progression in mitigation - i.e. stages through which countries could progress towards more ambitious mitigation outcomes over time (and thus manage the risks of overly ambitious mitigation policies in the short term, with risks from too ineffective mitigation policies that fail to achieve the goals of the Paris Agreement)? [Andy Reisinger, New Zealand]	Accepted. Paragraph added on policy progression in mitigation.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
23541	82	8			Inclusive risk governance incorporates people's knowledge and values into the decision-making process, enabling them to contribute their knowledge and values to make effective, efficient, fair and ethically acceptable decisions. This is a new concept that takes into account people's own actual situation and is more suitable for use under the new framework. [Huai Jianjun, China]	Rejected. Participation is essential and is acknowledged in the paragraph with reference to the more detailed section on participation of what is currently 7.7.4.
40095	83	15	83	22	It would be helpful to have more detail on these points. [, United States of America]	Accepted. Further detail added.
27401	83	1			The letters in Fig. 7.8 are too small. [, Germany]	Copyedit to be completed prior to publication.
7683	84	7	84	46	I would have expected a discussion spectrum of public participation in this section. Reference to the International Association for Public Participation spectrum of participation 2014 refers. The spectrum is a useful reference for decision makers and there is a nice graphic that could be used in that publication which can be accessed at www.iap2.org/page/A5 [Judy Lawrence, New Zealand]	Accepted. Spectrum has been included and referenced. However, there is very limited space for an additional graphs and it has not been included.
10493	84	33	84	35	Citation of a single thesis/book that is not freely available (expensive to purchase) is not adequate evidence to support this broad statement. Please include other citations to demonstrate the "medium agreement". If you refer to a book it is helpful to note the page(s) so readers can find the evidence. [Jean-Luc Chotte, France]	Accepted. More references have been added
40097	84	8	85	4	This text is not specific to the land sector and should be deleted. [, United States of America]	Rejected. We consider this section to be important for the chapter, but we have improved the narrative and included editions in the text that emphasize the relationship with "land" and land management.
3769	84	7			This should be more: inclusion in decision-making [Cordula Ott, Switzerland]	Accepted. Change in the title has been made to "Participation in Decision Making". Also the whole section has been moved to "governance"
12357	85	1	85	4	This statement is lacking references. [Hans Poertner and WGII TSU, Germany]	Accepted. References have been included.
5663	85	1	85	4	hard to follow and get the message! [Sanaz Moghim, Iran]	Accepted, editions have been made.
30571	85	5	85	43	This subsection is useful but could benefit by reporting that ILK is not only useful for informing "climate action", but is crucial for building more sustainable approaches to land management. The section should report that indigenous knowledge and belief systems promote sustainable use through sophisticated concepts and principles of rotation, replacement and moderate use applied under customary law norms and reinforced by spiritual beliefs, which scientific studies show directly affect practice and patterns of land and resources use, including the designation of no-go areas and sensitive sites that demand infrequent use and prohibit other uses (housebuilding, fires etc) - see for example Fragoso J, Silvius K, Luzar J, et al. (2010) "Space, Place, and Hunting Patterns among Indigenous Peoples of the Guyanese Rupununi Region" Journal of Latin American Geography 9(3): 213-243. doi: 10.1353/lag.2010.0030; [Thomas Griffiths, United Kingdom (of Great Britain and Northern Ireland)]	Lead Authors from all but one chapter have now integrated their material in a Cross-Chapter Box, which now includes more explicitly the points made here, although for space reasons we were unable to include the Guyanese case given

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
7685	85	6	85	43	There are some useful examples of Maori decision frameworks that are being implemented in land based settings that could be assessed for their value as models elsewhere and which are supported by the Treaty of Waitangi the partnership between iwi Maori and the Crown in New Zealand. Harmsworth G 2004. Maori and climate change : carbon sequestration opportunities on Maori land. In: Clarkson TS ed. Proceedings of the Workshop on the Science of Atmospheric Trace Gases, 2004. 125 ed. NIWA technical report. Wellington, NIWA. Pp. 148-150. . (Book Section, 2004) Harmsworth G, Awatere S, Robb M 2016. Indigenous Māori values and perspectives to inform freshwater management in Aotearoa-New Zealand. Ecology and Society 21(4): 9. https://doi.org/10.5751/ES-08804-210409 . (Journal Article, 2016)Harmsworth GR, Awatere S 2013. Indigenous Māori knowledge and perspectives of ecosystems. In: Dymond JR ed. Ecosystem services in New Zealand: conditions and trends. Lincoln, New Zealand, Manaaki Whenua Press. Pp. 274-286. . (Book Section, 2013) [Judy Lawrence, New Zealand]	Thank you - we have now cited one of these works in the Cross-Chapter Box that replaced this section.
12361	85	8	85	9	Suggest to refer also to the review of indigenous knowledge in the AR5 by Ford et al., who state that there are many gaps. Ford, J. D. et al., 2016: Including indigenous knowledge and experience in IPCC assessment reports. Nature Climate Change, 6 (4), 349-353, doi:10.1038/nclimate2954. [Hans Poertner and WGII TSU, Germany]	Thank you - now cited
40895	85		85		"democratic" or "participatory" (line 45)? [Valerie Masson-Delmotte, France]	Accepted: Corrected
3771	85	5			compare this subchapter to the one in Chapter 3. page 9 [Cordula Ott, Switzerland]	Accepted. But, all these section has moved to a new cross-chapter box, to maximize synergies between chapters. Lead Authors from all but one chapter have now integrated their material in a Cross-Chapter Box, including substantial amounts of material and references from Chapter 3.
12359	85	5			The examples in this section come all from the global south - is local knowledge irrelevant in the global north? [Hans Poertner and WGII TSU, Germany]	In the Cross-Chapter Box that has replaced this section examples from Australia, New Zealand, Korea, Spain and the Arctic region have been cited
2009	86	21	86	21	I think it should be stakeholders' or stakeholder. [William Lahoz, Norway]	Accepted: Copyedit to be completed prior to publication.
7221	86	24	86	24	Consider replacing ' develop' with 'development of'. [Debra Roberts, South Africa]	Accepted: Copyedit to be completed prior to publication.
6529	86	28	86	33	This part is true, but could be improved by showing how public policies can incentivize public participation, while others block it. [Sara Lickel, France]	Accepted: A reference has been included to address this comment
40897	86		86		what is specific to SRCL(first paragraphs)? [Valerie Masson-Delmotte, France]	Corrected: Editions to the texts have been made to "emphasize" land-based ecosystems. For example, changed "forested areas" to "land-based ecosystems, such as forests".
2011	87	18	87	18	I presume the authors mean Galicia, Spain (there is another Galicia in Eastern Europe). I suggest the authors identify which Galicia they mean. [William Lahoz, Norway]	Accepted: Corrected.
40099	87	27	88	2	This text is not specific to the land sector and should probably be deleted. [, United States of America]	Rejected. We have edited the text and included a new reference (Cowie et al. 2018. Land in Balance: The scientific conceptual framework for Land Degradation Neutrality), which highlights the importance of social learning in land-based mitigation.
5665	88	12	85	13	it is right: "risks from emissions reduction schemes" risks from emission reduction? [Sanaz Moghim, Iran]	This sentence deleted
24337	88	1	88	2	and in processes of participatory evaluation Fra.Paleo, U. 2015. Structure, process, and agency in the evaluation of risk governance. In Fra.Paleo, U. (editor). Risk governance. The articulation of hazard, politics and ecology. Dordrecht: Springer. pp. 237-273. [Urbano Fra.Paleo, Spain]	Corrected: Reference has been included

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
25707	88	4	88	32	This section aims to cover, in a general and non-sector-specific way, the issues of corruption and capture of elites in participation in decision-making for climate change and land. While it is legitimate to integrate REDD+ into this framework, it must be done in a balanced way with all other issues, including sustainable land management, combating desertification, combating land degradation or food security. There is currently too much imbalance in these paragraphs in the current wording, with excessive emphasis on REDD+ and which betrays a clear subjectivity of the authors. It would be more appropriate to revert to general and not sector- or approach-specific paragraphs. [, France]	With respect, the literature that explicitly addresses corruption in climate action tends to focus on REDD+, including the empirical and locally-focused study of Fadairo et al. We have shortened the section which helps to avoid an over-focus on REDD+ and added assessment of an additional reference which does not concern REDD
25709	88	4	88	32	Some other references that could be used: - Fredriksson, P. G., & Neumayer, E. (2016). Corruption and climate change policies: do the bad old days matter?. Environmental and resource economics, 63(2), 451-469. - Hasan, M. M., & Tóth, J. (2015). Corruption and the agricultural production efficiency of the European countries during the recent economic crisis. Research in Agriculture Livestock and Fisheries, 2(3), 427-437. - Rahman, M. A. (2018). Governance matters: climate change, corruption, and livelihoods in Bangladesh. Climatic Change, 147(1-2), 313-326. [, France]	Thank you. The Fredriksson and Neumayer article had already been cited, and the Hasan and Toth article is insufficiently tied to climate change. The Rahman article is a useful reference that we have now cited.
29863	88	4	88	45	This section should have a sub-heading more on corruption and corporate capture of climate actions and interventions. The corporate capture and institutional corruption has been masked under corruption and elite capture. The contents point out to the same. [Souparna Lahiri, India]	Introducing further sub-headings would detract from readability. It is hard to draw precise boundaries between corporate capture and elite capture
40101	88	11	88	17	This discussion is speculative and dated. Recommend deletion. [, United States of America]	This sentence deleted
17513	88	12	88	19	Better to use only "REDD+" instead of "REDD", as in the rest of the document, to avoid questions of whether the use of different acronyms was intentional (and given that REDD and REDD+ are often interpreted slightly differently) [Dirk Nemitz, Germany]	One mention of REDD deleted, but where the study by Brown is addressed it would be incorrect not to use the terminology he uses
40899	88		88		very interesting elements here, could be elevated to ES/SPM in barriers to deployment of SLM. [Valerie Masson-Delmotte, France]	considered but space did not permit
17919	89	7	89	9	For Parties who have ratified the Paris Agreement, they have NDCs rather than INDCs. [Quentin Lejeune, Germany]	Accepted and revised.
27403	89	7	89	11	It seems incorrect, that Parties are to report their adaptation needs under the Paris Agreement. Adaptation needs are recognized in the PA, but not in the context of reporting. In addition, this paragraph again is biased towards adaptation and does not address mitigation. Please mention performance indicators for mitigation as well, e.g. through the GHG inventories submitted to the UNFCCC. [, Germany]	Accepted and revised.
32357	89	8	89	8	NDCs [Sofie Linder, Sweden]	Copyedit to be completed prior to publication.
2013	89	9	89	9	I think it should be "NDC". [William Lahoz, Norway]	Copyedit to be completed prior to publication.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
10495	89	12	89	14	Rather than citing a proposal from IUCN, include the conceptual framework for LDN produced by UNCCD's Science Policy Interface Orr et al and Cowie et al 2018 (latter already in reference list and the former is the framework itself which was endorsed by UNCCD country parties in 2017) and the guidance on reporting on LDN for SDG 15.3 (Sims et al 2019) Orr, B.J., Cowie, A.L., Castillo Sanchez, V.M., Chasek, P., Crossman, N.D., Erlewein, A., Louwagie, G., Maron, M., Metternicht, G.I., Minelli, S. and Tengberg, A.E., 2017. Scientific conceptual framework for land degradation neutrality. In Bonn, Germany: United Nations Convention to Combat Desertification (UNCCD) (pp. 1-98). Sims, N.C., England, J.R., Newnham, G.J., Alexander, S., Green, C., Minelli, S. and Held, A., 2019. Developing good practice guidance for estimating land degradation in the context of the United Nations Sustainable Development Goals. Environmental Science & Policy. 92:349-355 [Jean-Luc Chotte, France]	Accepted and reference added.
10497	89	30	89	30	(and throughout) bioenergy is one word [Jean-Luc Chotte, France]	Copyedit to be completed prior to publication.
5667	89	33	89	33	"Local communities understand local dynamics ...", is it proper to say! Usually we need to increase local awareness and update them regarding new forcing and situation! [Sanaz Moghim, Iran]	Accepted. Sentence deleted.
27407	89	37	89	45	We appreciate the assessment provided in this section and suggest an even more comprehensive analysis of the relevance of strong legislation and regulations for successfully implementing carbon pricing options through either GHG markets or GHG taxes because they seem key to setting adequate caps. On the mitigation side, please assess comprehensively the necessity following from the Paris Agreement to mainstream all policies (including market-driven approaches, see e.g. Box 7.4, 2nd para or chapter 5, table 5.7) regarding their adequate contribution to the implementation of long-term targets of the Paris Agreement, including its temperature goal. Please provide a detailed analysis of the knowledge on trade-offs and synergies in the context of sustainable development and the SDGs, also referring to other chapters of the SRCL, e.g. chapter 5 in relation to food systems. These issues are highly policy relevant and we also welcome an assessment of knowledge gaps. [Germany]	Rejected in part. Chapter 6 has detailed response options and tradeoffs. Chapter 7 has picked up policies. SSPs have been added for future pathways. Knowledge gaps have been added to in 7.8
25711	89	38	89	45	This chapeau paragraph should be improved by mentioning the SDGs, the NCPs and by recalling some key findings from the IPCC SR15 (especially with figure SPM-4). [France]	Accepted. 7.6.6 covers SDGs. It has been revised.
40103	89	40	89	45	This text is not specific to the land sector and should be deleted. [United States of America]	Rejected. Environmental goals are applicable to the land sector.
27409	89	42	89	43	The statement "Market-driven approaches such as carbon pricing have uncertain effects on emissions but may be favoured politically and economically." is not consistent with other statements in the report that are much more balanced please check e.g. Box 7.4, and revise this section accordingly. Please see also our comment on the Entire Report. [Germany]	Accepted. Section has been revised.
10499	89	42	89	43	inconsistent with previous statement on market-driven approaches for managing emissions section 7.5.4.4: The advantage of carbon pricing is environmental effectiveness at relatively low cost; non-price policy instruments have considerably higher abatement cost and are less effective at covering diverse sources of emissions (Baranzini et al. 2017). [Jean-Luc Chotte, France]	Accepted. Section has been revised.
27405	89	37			We strongly suggest adding a subsection to section 7.6.7 on the effects of inaction (no further mitigation actions beyond those in place today, BAU). This will help contextualize the negative side effects of other response options. [Germany]	Accepted. Cross chapter box on SPM4 and Futures has added the idea of ineffective mitigation efforts and policies. This is akin to onaction.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
25713	90	1	90	2	This box should be updated with the 1,5°C climate target, and more inputs from the IPCC SR15. [., France]	Noted. This box has been removed. There is now a new Cross-Chapter Box on illustrative future climate and landpathways deals with this. SPM4 figure.
27411	90	1	90	12	Please mention that IAMs have serious shortcomings for the land sector and refer to the other chapters where this issue is addressed. [., Germany]	Noted. This box has been removed. There is now a new Cross-Chapter Box on Pathways covering this topic.Chapter 1 has dealt with scenarios and uncertainty.
40105	90	1	90	26	Although the figure is possibly useful, the text in Box 7.4 is only slightly linked to the land sector. It also contains inappropriate prescriptive statements -- e.g., about the Paris Agreement requiring a global carbon price. Recommend deletion. [., United States of America]	Noted. This box has been removed. There is now a new Cross-Chapter Box on Pathways covering this topic
22917	90	1	90	28	This box is not necessary: IAMs are already introduced multiple times (a bit more attention to the limitations of these models would be justified) and the figure and supporting text repeats most of what has been mentioned in Chapter 6 already (and is not fully consistent with Chapter 6) [Anastasios Kentarchos, Belgium]	noted. This box has been removed. There is now a new Cross-Chapter Box on Pathways covering this topic
29723	90	15	90	15	There is no longer a "2 degree target" - see the Paris Agreement [., Saint Lucia]	noted. This box has been removed. There is now a new Cross-Chapter Box on Pathways covering this topic
10501	90	20	90	21	...bioenergy and BECCS incentives potentially resulting in trade-offs... (there is potential that trade-offs will occur; but they can be avoided/minimised) [Jean-Luc Chotte, France]	noted. This box has been removed. There is now a new Cross-Chapter Box on Pathways covering this topic
27413	90	22	90	23	The statement "Removing fossil fuel subsidies has the potential to reduce GHG-emission but its mitigation effectiveness is debated and possibly low" is contradictory to the statement on page 7-47, please correct. [., Germany]	noted. This box has been removed. There is now a new Cross-Chapter Box on Pathways covering this topic
17933	90	26	90	26	This figure 7.9 seems somewhat arbitrary and it is not very easy to pull useful messages from it. E.g. what should we conclude about fossil fuel subsidies and carbon pricing from this figure? And is all bioenergy bad for sustainable development? [Quentin Lejeune, Germany]	noted. This box has been removed. There is now a new Cross-Chapter Box on Pathways covering this topic
29721	90	26	90	29	A challenge with figure 7.9 is that it does not represent any portfolio of policy options, and cannot show regional differences. For example, does bioenergy production always have negative trade-offs, or can it have positive effects in some contexts (e.g. energy production, income generation). Also it is surprising to see that fossil fuel subsidies removal has such a small mitigation benefit, and while it is encouraging to see that healthy diets can have such a positive impact on mitigation, this leaves the reader wondering what scale of change is assumed here. Overall this image seems to give a different impression to the analysis in SR1.5. [., Saint Lucia]	noted. This box has been removed. There is now a new Cross-Chapter Box on Pathways covering this topic.Related information is now in SPM figure 4.
40901	90		90		what is the source of this figure (cited literature), method to build it? Relevance for SRCL? (carbon tax = meat tax?). What about poverty aspects? (attention to those most vulnerable both to climate change and climate policies)? [Valerie Masson-Delmotte, France]	noted. This box has been removed. There is now a new Cross-Chapter Box on Pathways covering this topic
21657	90	27			I quite like this figure. The bubble on fossil fuel subsidies seems out of place (why include this in a report on climate change and land - why not any other policy intervention that would reduce gross CO2 emissions?) It's probably too ambitious to think this could be brought into the SPM but perhaps worth considering. A bubble on regulations, standards and good practices probably should be added (I'd suggest this achieves less mitigation but could be more positively aligned with SDGs than carbon pricing). [Andy Reisinger, New Zealand]	noted. This box has been removed. There is now a new Cross-Chapter Box on Pathways covering this topic.Regret that based on other review comments this figure is gone and the information is in SPM Figure 4.
27415	90	27			Figure 7.9: Please explain the trade-offs of carbon-pricing and removing fossil fuel subsidies in the text. [., Germany]	noted. This box has been removed. There is now a new Cross-Chapter Box on Pathways covering this topic

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
25733	91	7	91	12	We welcome the presence of agroforestry. Agroecology more largely could be present, taking into account the mix of several practices giving mitigation and adaptation as a whole, for example diversification (adaptation) with legumes in the rotation or inter-seasonal (mitigation). [, France]	Thank you!
25715	91	7	91	21	Other approaches on agriculture and climate change should also be discussed, including agroecology, including agroforestry on agricultural soils and increasing organic carbon in soils, precision agriculture, organic agriculture, etc. [, France]	Discussed here and elsewhere in the chapter
40107	91	16	91	21	This text contains an implicit value judgment about the mainstream agricultural sector that is inappropriate for an IPCC report. Reframe or delete. [, United States of America]	Reframed
25717	91	22	91	27	This paragraph should also discuss the value of sustainable forest management for combining forest mitigation and adaptation. [, France]	Done here and elsewhere in the section
11527	91	22	91	27	The following paper analyzed a synergy potential in terms of CO2 emission reduction between climate change mitigation in the forest sector and forest conservation policy in Indonesia as a case study for achieving multiple sustainable development objectives. The study elucidated that mitigation costs will be reduced by implementing climate change mitigation and forest protection simultaneously. This suggests that synergy effect in the forest sector exists and addresses the contributions to SDGs 13 and 15 (particularly, Targets 13.2 and 15.2) at the same time. Matsumoto, K., T. Hasegawa, K. Morita, and S. Fujimori. 2018. Synergy potential between climate change mitigation and forest conservation policies in the Indonesian forest sector: implications for achieving multiple sustainable development objectives. Sustainability Science, DOI https://doi.org/10.1007/s11625-018-0650-6 . [Kanako Morita, Japan]	Added
10503	91	30	91	32	It is good to see this recognised. [Jean-Luc Chotte, France]	Thank you!
40109	91	35	91	45	This text is not specific to the land sector and should be revised or deleted. [, United States of America]	Revised
12363	91	46	91	47	Refer also to Chapter 4 (Section 4.11.8) discussing maladaptation leading to coastal degradation on small islands. [Hans Poertner and WGII TSU, Germany]	See Table 7.1

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
5231	91	46	92	13	<p>This paragraph is important because it argues maladaptations exist across the land sector not only in developed countries but also developing countries. However, the paragraph lacks evidence from developing countries. Therefore, to strengthen the argument, we added an additional example to the maladaptation in developing countries and grammatically modified next sentence:</p> <p>"Maladaptations exist across the land sector in developed and developing countries, and some may only begin to be recognised now as we become more aware of the unintended consequences of decisions. An example prevalent across many countries is irrigation as an adaptation to water scarcity. During a drought from 2007-2009 in California,thereby perpetuating the maladaptive situation. In developing countries, holistic land use management that prevents forest conversions and promotes community-based forest management is one of possible adaptation options (FAO, 2008; Seppälä et al. 2009). For example, Cambodia seeks holistic adaptation strategies that sustain natural forests in the area with high pressures of agricultural development and encourages community agro-forestry as an adaptation option to support rural farmers' livelihoods and mitigate flood and drought risks (Royal Government of Cambodia 2006, 2010). In the field, however, local land use management causes forest conversions to plantations and affects farmers whose livelihoods depend on forest product collections and sales. Some of the affected farmers make up for their deficits by eventually converting remaining forest including community forests to other land uses (Ehara et al., 2018). This land use management can be holistically maladaptive because it triggers farmers' short-term coping strategies which forecloses the future adaptation options and threatens their ability to ensure food security in the long-term. These examples highlight..."</p> <p>Added reference Ehara, M., K. Hyakumura, R. Sato, K. Kurosawa, K. Araya, H. Sokh, and R. Kohsaka, 2018. Addressing Maladaptive Coping Strategies of Local Communities to Changes in Ecosystem Service Provisions Using the DPSIR Framework. Ecol. Econ., doi:10.1016/j.ecolecon.2018.03.008. FAO 2008. Conference Report for Adaptation of forests and forest management to changing climate with emphasis on forest health: A review of science, policies and practices. Umeå, Sweden, 25–28 August 2008. FAO, Rome. Royal Government of Cambodia 2006. National Adaptaion Programme of Action to Climate Change (NAPA).</p>	Example of farm ponds in Maharashtra, India added in addition to other revisions
11529	92	20	92	22	<p>Minor corrections. National level institutions that cover the spectrum of sectors affected, or enhanced collaboration among relevant institutions are likely to increase the effectiveness of policy instruments, as are joint programmes and funds (Morita and Matsumoto 2018) [Kanakano Morita, Japan]</p>	Done
32359	92	37	92	37	SDGs [Sofie Linder, Sweden]	Revised section on SDGs and trade-offs
40903	92		92		check how maladapttation is addressed across chapters, introduced in ch 1, and help provide an integrative outcome of assessment in individual chapters. [Valerie Masson-Delmotte, France]	Noted. All efforts to achieve consistency across chapters have been taken.
25719	92	46	93	2	The interest of NCPs is not limited to only fresh-water and river systems, but is much more general. This sentence should be generalized and placed in the chapeau of section 7.6.7. [France]	Revised
25721	93	3	93	3	Consistency between this section and the appropriate elements of SR15 should be strengthened, particularly in relation to Figure SPM-4 and Section D4 of the SPM (see also Sections 2.5, 4.5 and 5.4 in the report chapters). [France]	Noted and revised

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
22919	93	3	93	44	This section overlaps with the treatment of synergies and tradeoffs with SDGs in Chapter 6 and is not fully consistent with Chapter 6. Suggestion to remove this part to avoid overlap/inconsistency and expand the section on how policy options could enhance synergies and avoid tradeoffs [Anastasios Kentarchos, Belgium]	Revised section to minimize overlap with Chapter 6 and focus on policy options
40905	93	14	93	15	relevant for SPM? [Valerie Masson-Delmotte, France]	Noted.
40111	93	22	93	24	The framing of the SDGs is not itself a "threat" to biodiversity and ecosystems. [, United States of America]	Revised
7223	93	24	93	24	Drop 'INDC' as this acronym was used only twice in this chapter. [Debra Roberts, South Africa]	Revised and removed
25121	93	31	93	33	Add references Zeng Z, Liu J., Koeneman P.H., Zarate E., Hoekstra A.Y., 2012. Assessing water footprint at river basin level: a case study for the Heihe River Basin in northwest China. Hydrology and Earth System Sciences 16(8): 2771-2781. Physical and virtual water transfers for regional water stress alleviation in China. Proceedings of the National Academy of Sciences of the United States of America 112(4): 1031-1035. [Junguo Liu, China]	Added and cited.
40113	93	45	99	16	The text in this part of the chapter is general, highly academic, and of limited utility to the core audience of IPCC reports. It has little concrete to say that addresses issues in the land sector. Recommend deleting or paring back much of these sections. [, United States of America]	Revised and restructured
40907	94	11	94	23	check cross chapter coherency, complementary, and redundancy on the "nexus "approach (also last paragraph of ch 5). [Valerie Masson-Delmotte, France]	Accepted. Checked for cross chapter redundancy.
12365	94	35	94	35	Maybe better 'climate-resilient development' than 'sustainable development', to be more climate-specific. [Hans Poertner and WGII TSU, Germany]	Accepted and revised.
7687	94	26	98	12	This text is somewhat high level and long and could be targeted more accessibly to the decision making audience. The key messages are buried in the text.. Section 7.7.3 is where they will be interested in reading how they might use governance and institutions to enable adaptation in particular. But also mitigation. The concepts are all good but they beg the "so what" question which is not fully answered in this text. What do teh concepts mean for decision makers? Suggest this whole section be more targeted at the decision making audience as they are the ones that operate in the governance, institutional and participatory space. [Judy Lawrence, New Zealand]	Accepted. Title of 7.7.1 changed to include mitigative capacity. Section amended to refer to specific instituions (learning) and refer to characteristics of governance that are also examples of adaptive institutions.
27417	94	25	109	21	Section 7.7 has a bias towards adaptation. We consider it essential the authors to extend their assessment to address governance related to mitigation actions in the land section in this section in more detail and thank you in advance for your efforts. [, Germany]	Accepted. Title of 7.7.1 changed to include mitigative capacity.
25127	94	13			Add references Liu J., Mao G., Hoekstra A.J., Wang H., Wang J., Zheng C., van Vliet M.T.H., Wu M., Ruddell B., Yan J., 2018. Managing the energy-water-food nexus for sustainable development. Applied Energy 210: 377-381. [Junguo Liu, China]	Added
21659	94	25			Should section 7.7 include a sub-section on institutions building mitigative capacity (to mirror section 7.7.1?) Mitigative capacity is sorely missing at institutional level in many countries, i.e. ability to envisage mitigation options consistent with broader development goals, governance to achieve outcomes and balance trade-offs associated with mitigation etc [Andy Reisinger, New Zealand]	Accepted. Title of 7.7.1 changed to include mitigative capacity.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
5481	95	6	95	44	The subchapter is rather a scientific processing of related literature and running through the main definitions and as a consequence of this, a bit too general in its content. It would be having a practical use to include some concrete recommendations or proposal to policy makers, planners and decision makers. [, Hungary]	Accepted and more concrete concepts and examples provided.
6531	95	24	95	25	This should be kept in the final version of the text. [Sara Lickel, France]	Accepted. Retained.
21707	95	35	95	35	The problems of making frameworks of resilience relevant to local needs and experiences is well summarized in this paper: Forsyth, T. (2018) 'Is resilience to climate change socially inclusive? Diversifying theories of change in Myanmar,' World Development 111: 13-26. [Timothy Forsyth, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Reference and shortcoming added.
12367	95	6			Could this section give some examples of institutions building on adaptive governance related to climate change and land? [Hans Poertner and WGII TSU, Germany]	Accepted and examples added and referred to.
21913	95	34		36	7.7.1 Institutions Building Adaptive Capacity. Recast [Olusegun Adeaga, Nigeria]	Accepted and section has been revised.
12369	96	13	96	14	It is not clear which evidence this confidence statement is based on. [Hans Poertner and WGII TSU, Germany]	Accepted and literature added.
23601	96	1	97	28	Urban forest should be dealt in the context of sustainable development, in local (and city) level. [, Republic of Korea]	Rejected. While urban forests may be within the scope of the chapter, no scientific evidence/ publication provided to support changes suggested by the reviewer.
5669	98	45	98	48	"Transformation of governance" needs to clarify! [Sanaz Moghim, Iran]	Accepted and reference and explanation added.
40909	99		99		could also cover fiber (e.g; cotton crops, associated textile industry, fashion etc). Interlinkages too? [Valerie Masson-Delmotte, France]	Accepted and revised.
40115	99	26	100	48	This text should be revised to remove value judgments and prescriptive statements. The claim on lines 21-22 that "Americans have spent the past Century [sic] populating low-lying flood prone and coastal areas" is sweeping in its expression and inappropriately focused on a subset of people, especially given that this population trend goes back to the dawn of human history and applies to civilizations across the globe. [, United States of America]	Accepted and revised.
7569	99	18	102	46	Find consistency between "inter-linkages" and "interlinkages". Same for "bio energy" and "bioenergy". [Durwood Zaelke, United States of America]	Copyedit to be completed prior to publication.
7645	99	18	102	46	Find consistency between "inter-linkages" and "interlinkages". Same for "bio energy" and "bioenergy". [Kristin Campbell, United States of America]	Accepted. Copyedit to be completed prior to publication.
12371	99	32			Does this imply that the section only addresses riverine flooding and not coastal flooding? Suggest to be clear on this to avoid confusion [Hans Poertner and WGII TSU, Germany]	Accepted and revised to avoid confusion.
32983	101	1	101	1	I found that the Figure 7.10 on page 7-101 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 Figure 7.8 on page 7-83 does a more straightforward and easily understandable job of visualising the key concepts in adaptive risk governance. [Mairi Dupar, United Kingdom (of Great Britain and Northern Ireland)]	Rejected. The risk Propeller figure has been amended so Hazards are reflected from Table 7.1(not the who) and the wording corresponding to the arrows has been simplified. The diagram illustrates the circular connection to responding to disasters and adaptive management. The previous figure 7.8 has been retained but illustrates two processes. This figure and the text surrounding it illustrates how governance brings these processes together.
25735	101	2	101	2	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]	Accepted and figure revised.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
2015	101	2	101	2	I suggest the authors increase the font of the smaller sized text in Fig. 7.10. [William Lahoz, Norway]	Copyedit to be completed prior to publication.
33771	101	17	101	18	Quotation "It is also important to note that more than 50% of biomass used for energy today is for traditional uses, which contributes 1.9-2.3% of global GHG emissions (Cross-Chapter Box 8: Traditional Biomass). Question: Is regrowth of woody biomass included in these numbers? Some of the traditional woodfuels can also be based on sustainable harvest of firewood? Short lived climate pollutants like BC from biomass burning will be followed by organic carbon (OC) emissions that in a longer timespan will act as cooling agents. Is this effect included in the numbers? What kind of metric is used for claiming that 1,9-2,3 % of global GHG emissions are partly a result of SLCP? GWP10? [, Norway]	Accepted although this information has been instead shifted and provided in the cross-chapter box on Traditional Biomass.
5671	101	19	101	21	"Tradeoffs" of what? Probably at the end of the sentence (water resources and food security) [Sanaz Moghim, Iran]	This has been clarified.
7225	101	27	101	27	Italicise confidence statement. [Debra Roberts, South Africa]	Done.
27419	101	27	101	29	"There is medium agreement and medium evidence that a large-scale expansion of bioenergy and biofuels will increase competition for land and water, potentially including lands with high carbon stocks or high conservation value and biodiversity." Please check the confidence levels regarding statement on bioenergy and BECCS across this report (e.g., chapter 1 makes a similar statement but with virtual certainty. [, Germany]	Accepted although wording has changed somewhat in that this box focuses more on governance rather than competition and impacts per se.
10505	101	28	101	29	"potentially threatening lands with high carbon stock or high conservation value" would be more accurate. There are strong efforts being made to protect high C stock and high biodiversity value areas. [Jean-Luc Chotte, France]	Accepted, however has been referred to the cross-chapter box and to chapter 6.
40911	101		101		Case study of governance on biofuels and bioenergy : relevant for SPM, if key finding identified and formulated. [Valerie Masson-Delmotte, France]	Noted.
21661	101	9	102	46	I found this section to contain relatively little on governance - it seems to be more focused on risks and issues than on governance to deliver solutions. The key question is how to avoid the potential problems, and what governance is needed to achieve those outcomes. E.g. a number of papers have looked at how BECCS could be implemented at scale in ways that do not have major negative side-effects - what do we know about the governance needed to achieve those outcomes? [Andy Reisinger, New Zealand]	Accepted; many references added relevant to governance of impacts, but reference has also been made to other sections and boxes to strengthen the connections. Note that the emphasis is on Bioenergy side of BECCS where the land impacts occur whereas the CCS side is out of scope.
40117	101	9	102	46	The topic of this case study should be a central topic of the report, but the discussion here sheds relatively little light on it. Perhaps it should be integrated with other chapters of the report? [, United States of America]	Accepted; has been strengthened as per reviewers' requests.
12373	101	9			The governance aspect in this case study is relatively weak. It should be expanded, and the impacts and trade-offs can be shortened, as they are also discussed in other chapters of this report. [Hans Poertner and WGII TSU, Germany]	Accepted; governance aspects strengthened and many new references added, while impacts and trade-offs shortened considerably.
10507	102	9	102	9	carbon stock in standing biomass is not soil organic carbon! [Jean-Luc Chotte, France]	Accepted, this has been corrected.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
32635	102	24	102	26	<p>Page 7-102 lines 24-26. This language claims that the impacts of cultivating bioenergy crops on soils that could be used for food production could be not only positive (increases) but “negative” depending on the scenarios. This discussion is inaccurate for many reasons.</p> <p>First, none of the three papers cited find that bioenergy demand reduces food prices (Schlenker 2013; Borychowski and Czyzewski 2015; Martin Persson 2015). Second, it is difficult if impossible to imagine scenarios in which increased demand for agricultural output would reduce food prices. According to basic supply and demand curves, increased demand increases prices. Special, dynamic stories would have to be told to find price decreases, e.g., through the spur of new technology, and they would only occur in the medium or long-term because the spur would have to result from an increase in prices.</p> <p>Finally, the increase in price is not the measure of effects on food security. It is the combination of increases in prices and the sensitivity of demand. For example, if many poor people are extremely sensitive to price, so a 1% increase in price would result in a large reduction in consumption, then even a large increase in bioenergy demand on agricultural land would only result in a 1% increase in price. [Timothy Searchinger, United States of America]</p>	<p>Agreed and accepted that the language was imprecise in distinguishing between food price impacts and food security impacts. This language has been clarified and furthermore the box now focuses on overall governance approaches in relation to bioenergy, land and climate so the specific impacts on food prices and security are not addressed in detail.</p>
22921	103	5	103	6	<p>uncertainty statement here does not correspond with similar statement in section 6.3.3.1 [Anastasios Kentarchos, Belgium]</p>	<p>We could not find the uncertainty statement referred to in 6.3.3.1.</p>
40119	103	6	103	7	<p>Suggest citing some examples from development donor reports. [, United States of America]</p>	<p>We have deleted this particular statement as not doing justice to the peer-reviewed literature we have assessed and cited. Examples of donor and/or international agency reports cited here include Quan and Dyer 2008, references from World Bank, RRI, Frechette et al. and several others.</p>
2947	103	1	106	8	<p>This discussion of land tenure is much weaker than that in chapter 6, particularly as regards forests. The rows on forests in table 7.5 are confusing and lack any clear message. In contrast chapter 6 makes multiple accurate references to the strong evidence that greater tenure security in traditional community forested lands is associated with reduced deforestation and other climate mitigation benefits, particularly when Indigenous Peoples manage them. It would be important to ensure the content of the two chapters is aligned. [David Kaimowitz, Nicaragua]</p>	<p>Much of the chapter 6 text and assessment, especially on forests, has now been brought into this section, including the table, which now has clearer messages concerning forests</p>

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
30573	103	1	107	27	This section on land tenure is useful, but contains a number of gaps and omissions and some questionable statistics. The figure of 18% of forest under customary and common property systems is likely a major overestimate as other studies in Africa have put the figure closer to 80%. Table 7.5 appears to miss major evidence and policy implications noted elsewhere in the IPCC report but *not* documented in the summary table, which is a major weakness. It is strongly recommended that this table is reworked to improve its utility for policy makers and climate scientists and governments. In the case of forest for example, the information in the cells appears highly selective, truncated and overlay focus on one policy instrument (REDD+). As a minimum, this section should record the positive correlations between secure legal tenure for collective customary tenure regimes and intact forests, low deforestation and low GHG emissions. The policy implications in the final column in the same section necessarily need to pinpoint the logical option to fast track global support for securing indigenous and common property tenure regimes in high carbon stocks and high conservation value forest - as well as other ecosystems (wetlands etc) with high carbon storage and massive potential for the generation of local and global co-benefits for the planet and humanity. It has been documented already that many of these high carbon ecosystems are located within the customary tenure systems of indigenous peoples and customary landowners - see Garnett ST et al (2018) "A spatial overview of the global importance of Indigenous lands for conservation" Nature Sustainability 1 (July 2018):369-374 PLEASE SEE ALSO COMMENTS AND SCIENTIFIC SOURCES ON CORRELATIONS BETWEEN TENURE AND FOREST/CLIMATE PROTECTION ON CHAPTER 6 ABOVE [Thomas Griffiths, United Kingdom (of Great Britain and Northern Ireland)]	The section and table have been comprehensively rewritten, including many of the points made here. In particular, much of the chapter 6 text and assessment, especially on forests, has now been brought into this section, including the table, which now has clearer messages concerning forests. The 18% figure has been deleted.
6533	104	1	104	1	in the case "Smallholder cropland/Implications of land tenure for mitigation of climate change", the authors should be careful with the use of "climate smart practices", as there is no accepted definition of this expression. A second thing is to justify why planting trees or mixed cropland requires land rights: because those are long-term practices that imply for the peasant to have secured land. [Sara Lickel, France]	With respect, we don't think a judgement at this level demands a precise definition of "climate smart practices". The word "long-term" has been added to the relevant cell of the table to address the second half of the comment
40121	104	1	106	1	This table is a good example of how to array material to show the climate change and land linkages. It should be formatted to enhance readability. A substantive question: Why do REDD+ programs increase land tenure insecurity? This seems counterintuitive, given that REDD+ may need to rely on secure land tenure to manage payments for carbon storage. [United States of America]	Thank you for your support for the table. Formatting will be done at final production stage. The statement that "REDD+ programmes tend slightly to increase land tenure insecurity on agricultural - but not on forest - lands" is borne out by the reference cited (Sunderlin et al. 2018) and is a result of the special conditions obtaining on some forest frontiers.
40913	104		106		Missing traceability to literature assessment in Table 7.5 and missing assessment of level of understanding, confidence etc. [Valerie Masson-Delmotte, France]	With respect, we don't think it's feasible to add confidence statements to each cell. We provide more confidence statements to more specific findings in the paragraph immediately after the table.
6535	107	2	107	27	This part does not give enough importance to the role of secure land tenure for communities in preserving the environment, and thus reducing GHG emission through the implementation of agroecology practices or through the reduction of deforestation by securing Indigenous Peoples' land rights. [Sara Lickel, France]	these points are now made clearly within the table and in the paragraph which follows the table.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
40123	107	15	107	27	This paragraph is beyond the mandate of the report. As noted, it draws upon specific studies but not widespread evidence, and does not present a full characterization of the range of views. There are legal challenges with the interpretation of "consent;" and thus some stakeholders interpret "consent" as "consultation." Suggest the following revisions: "A separate but related issue is that of Free Prior Informed Consent (FPIC), which as mandated by the United Nations Declaration on the Rights of Indigenous People, crucial part of self-determination, has been used as a means to ensure that people's rights are respected when mitigating climate change, especially when using mitigation options like REDD+. Currently FPIC is applied to implementation of strategies (Kane et al. 2018) and research (Fernández-Llamazares et al. 2017). There is strong agreement and low evidence that FPIC is an effective tool if used correctly. Indigenous groups through FPIC are demanding proper representation of communities, including marginalized groups and true power-sharing (Sovacool et al. 2016). [DELETE:] However, FPIC concept becomes ambiguous when it no longer refers to consent, but] [ADD: WHEN FPIC REFERS TO consultation instead OF CONSENT][DELETE, which may facilitate the widespread violation of indigenous peoples' rights][ADD: THE IMPLICATIONS OF THE PROCESS MAY BE DIFFERENT DEPENDING ON THE NATIONAL CONTEXT, BUT OFTEN FOCUS ON LEGITIMATE, REPRESENTATIVE CONSULTATION WITH AFFECTED STAKEHOLDERS RATHER THAN EXPLICIT CONSENT OF EVERY SINGLE INDIVIDUAL. (Prior and Heinämäki 2017). In terms, of implementation, FPIC [DELETE: is][INSERT: MAY BE] hampered by a number of legal and institutional barriers, including the non-binding nature of the FPIC guidelines and [the challenges facing governments [SUGGEST REPLACING: INSTITUTIONAL CAPACITY, LEGAL FRAMEWORK, AND RELATIONSHIP BETWEEN GOVERNMENTS AND STAKEHOLDERS,] (Carodenuto and Fobissie 2015) but it is likely to be more accepted by the government if it is built upon the national legal framework on citizen rights (Pham et al. 2015). [, United States of America]	paragraph deleted
7689	107	29	107	47	One of the institutional dimensions completely missed in this text is "commons" in a natural ecosystems context. If we are to reduce emissions we need to manage the the natural ecosystems so they do not challenge the ability to reduce emissions from anthropogenic sources. How we do this relies upon regulatory practices and stewardship. The text needs to more actively discuss this huge challenge. [Judy Lawrence, New Zealand]	Noted. The chapter has addressed land and climate issues through sustainable land management practices and natural resources, GHJG emissions, and ecosystem services. The concept of the commons while applicable has been addressed through these concepts.
21915	107	30	108	6	7.7.5. Institutional dimensions of adaptive governance. Please recast this section. [Olusegun Adeaga, Nigeria]	Rejected. No scientific evidence and publication provided nor direction as to recasting required. This section has been revised but whether it meets this request to 'recast' is unclear.
40125	107	44	109	21	This text and Table 7.6 are very general and not sufficiently tied back to the scope of SRCL. They should be revised or deleted. [, United States of America]	Rejected. This text helps answer comment 922 about examples of institutions that build adaptive capacity and resilience. A link to the earlier section is made and further details in relation to land and climate added.
10509	108	7	108	7	Table title: Why "or" in the table caption? Which are the indicators? [Jean-Luc Chotte, France]	Accepted. Table revised and change of characteristics to indicators.
10511	108	7	108	9	Which are the indicators in this table? [Jean-Luc Chotte, France]	Accepted. Table is revised to show characteristics as indicators.
3773	108	1		21	This subchapter is strongly related to the Agenda 2030. as it addresses Inclusion. This concept also asks for equitable and just share of resources, but also in decision-making in SD and future forming processes. Capacity development of actors involved in processes is often necessary . Counterbalancing unequal power structures. This could be taken up here. [Cordula Ott, Switzerland]	Accepted. The table has been revised to show the indicators on the left hand side (instead of the previous word 'characteristics'). Agenda 2030 referenced in 7.7.6 inclusive governance.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
5233	109	8	109	15	<p>This paragraph is important because it emphasizes the need of looking beyond the rights of citizens to embody inclusive governance for sustainable development. However, current paragraph does not fully cover the issues. Therefore, we propose following improved paragraph.</p> <p>"Citizen engagement is important in enhancing natural resource service delivery by including them in management and governance decisions (see 7.6.5). In governing natural resources, focus is now not only on rights of citizens in relation to natural resources, but also on citizen obligations, responsibilities (Karar and Jacobs-Mata 2016; Chaney and Fevre 2001), feedback and learning processes (Tàbara et al. 2010). In this respect, citizen engagement is also imperative particularly for analyzing and addressing aggregated informal coping strategies of local residents in developing countries, which are important drivers of natural resource depletions, but often overlooked in a conventional policy development processes in natural resource management (Ehara et al. 2018)."</p> <p>Added reference Tàbara, J. D., X. Dai, G. Jia, D. McEvoy, H. Neufeldt, A. Serra, S. Werners, and J. J. West, 2010: The climate learning ladder. A pragmatic procedure to support climate adaptation. Environ. Policy Gov., 20, 1–11, doi:10.1002/eet.530. [, Japan]</p>	Accepted and revised paragraph included.
40915	109		109		Link to notion of "just, fair, ethical transition" expressed in SR15 could be expanded here in light of land aspects. [Valerie Masson-Delmotte, France]	Accepted and revised.
40127	109	23	110	34	It's good to see a discussion of uncertainties and knowledge gaps. What's here should be built out and made more comprehensive. The list provided seems a bit random; in particular, the last two items seem out of scope. [, United States of America]	Accepted. Section is revised.
7691	109		110	4	Issues not mentioned here in the bulleted list is the link with water; reducing further clearance of natural ecosystems; and intergenerational issues (add to the last bullet after uncertainties " and across generations." The changes on risk will advance and potentially accelerate over time so the future needs to be considered today. [Judy Lawrence, New Zealand]	Accepted. Water added to line 28 & 39 page 109. Across generations added.
12375	109	1			This section is very generic and should be more specific to climate change and land. [Hans Poertner and WGI TSU, Germany]	Accepted. Further detail added.
32361	110	19	110	19	SDGs [Sofie Linder, Sweden]	Copyedit to be completed prior to publication.
32363	110	21	110	21	SDGs [Sofie Linder, Sweden]	Copyedit to be completed prior to publication.
12663	110	30	110	34	<p>This is related to a comment made for page 2, line 1 to page 3, line 5.</p> <p>For the gap in understanding, I am not sure if there is any literature on evaluating the current policy framework (at any level) and its adequacy is managing response to climate change. It would be interesting to have an additional section/paragraph providing some indication of how governments might go about evaluating gaps and next steps. [Zelina Binti Zaiton Ibrahim, Malaysia]</p>	Accepted and Revised
25723	110	36	110	37	Given the importance of the concept of ecosystem service, and the massive use of it in this report, this cross-chapter box should be positioned in Chapter 1 Framing of the report. [, France]	Noted.
10513	110	36	111	47	First par seems unnecessary. It is a only a few pages - no need to summarise the contents. [Jean-Luc Chotte, France]	Box has been revised.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
12377	110	44	111	2	SRCCCL is much broader than the LULUCF report. It also builds on AR5 (e.g., the food security chapter). Therefore, relating back only to LULUCF here is not really convincing as an argumentation for applying the ecosystem services concept. [Hans Poertner and WGII TSU, Germany]	The box refers to LULUCF report as an example of a pre-ES concept report. The chapters each make the explicit argument for why ES/NCP should be considered as co-benefits or tradeoffs of different land management options. ES is mentioned in several places throughout the report in other chapters. In the ES box we have referred to another recent IPCC report that focused on land use but did not specifically address ES. So we try to focus on how ES has been well covered in this special report. So we building on and adding a new dimension of ES related to LULUC that builds on the earlier IPCC report and the evolution and application of ES thinking since the Millenium Ecosystem Assessment including NCP.
40917	110		111		section on knowledge gaps very prescriptive on research directions. Expressing what could not be assessed due to lack of evidence in literature would be nice. [Valerie Masson-Delmotte, France]	Box on ES/NCP mostly aims to provide context for terms used in report, therefore is not a comprehensive lit review on gaps in research which is beyond the scope.
27421	110	36	114	7	Cross-Chapter Box 7 introduces the two concepts at the same level. However the report addresses NCP only in chapter 6 and 7; chapter 5 does not discuss NCP, but mentions it only once and briefly on 5-82-27 (please revise lines 7-113-36). We therefore suggest to focus Cross-Chapter Box 7 on ES and to limit the discussion on NCP. [, Germany]	The Chapters discussed both concepts and agreed to use whichever one they thought most appropriate but everyone agreed that both concepts need to be covered in our report. The box clarifies how they are similar and different and why/how different chapters use each concept.
22923	110	36	114	8	This box starts from the Ecosystem Services concept and later on relates this to the NCP concept. In Chapter 6 the word Ecosystem Services is not mentioned at all and only reference is made to NCPs. Authors should harmonize language referring to ES/NCPs across chapters and it would be useful to put in the title of this box both Ecosystem Services and Nature's Contribution to People. [Anastasios Kentarchos, Belgium]	Box has been moved to Chapter 6. The box clarifies how ES and NCP concepts are similar and different and why/how different chapters use each concept.
40129	110	36	114	8	Cross-Chapter Box 7 addresses a relevant topic, but it's too long, and some of the discussion is too much "in the weeds" for an IPCC assessment. In particular, Box 7 Table 1 seems unnecessary to this report. [, United States of America]	Box has been revised and shortened.
24815	110	36	114	8	Box 7 (ecosystem services and their relations to land and climate systems) would have been a novel contribution if it had done what it set out to do, based on the objectives of the chapter 7. Page 7 line 40-41 summarizes the main objective of Chapter 7 "the chapter focuses on decision making and policy responses to risks arising from the interaction between climate, land, and humans." Consequently, for box 7 to be useful it needs to clearly show how ecosystem services could be influenced by different decision pathways (maybe look at SR1.5 for some ideas), as discussed throughout the chapter. This section attempted to explain how dif decision pathways influence ecosystem services under changing climatic and land conditions. But it didn't really do that--right now in the SOD box 7 only describes how climate change affects ecosystem services, not really how different pathways would affect ecosystem outcomes) [Justice Issah Musah Surugu, Germany]	Box has been revised and how different pathways impact ecosystem services is covered in SPM4 figure and text. Further, section 6.5.3 explicitly links risks to NCPs across response options to show how different policies/responses have different effects.
3775	110	36			Question is if this Box on Ecosystem services should come earlier... ES sometimes show up in other chapters without explanation. At least take care that reference to this Box is made in the texts. [Cordula Ott, Switzerland]	Agreed. Its been moved to Chapter 6
2017	111	33	111	33	It would help the reader if the authors introduced the acronym "MA". [William Lahoz, Norway]	Has been addressed by revised box.
18251	111	36	111	36	LPG not introduced [Julia Nabel, Germany]	The term LPG has been removed in the revised version

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
27427	111	36	111	48	Please shorten the introduction to the box and simply start with the definition of Ecosystem Services (ES) before entering into the discussion. In addition, we consider it highly important that IPCC reports correctly reflects the IPCC's procedures. Therefore, please remove normative language ("it is timely...") and please correct "Decision and Outline" as the Outline is part of the decision, and it does not request an "examination" but an "assessment". Please do not dwell on the scope of the SRCCL versus the SR on LULUCF as these have been decided by the IPCC Plenary and are not up for discussion. [, Germany]	Box has been revised.
40919	111		111		describe briefly extinction crisis. I find that this box linked with key framing used in x chapters (3, 4 etc) is arriving too late at this location. [Valerie Masson-Delmotte, France]	Have added extinction to the discussion of biodiversity. The CC box on ES is now in Ch 6, where it prefaces a discussion of how the response options impact ES/NCP
27423	111	7			What is the difference between "trade-offs" and "adverse side effects"? Please check the wording. [, Germany]	They are the same thing. Box has been revised.
27425	111	13			Is "extinction crisis" a commonly known expression? If not, please clarify or avoid this expression. [, Germany]	Yes, extinction crisis is a well-known term in conservation biology. This is term from the literature of the 1960s to indicate precursor interest in ES. eg: Ceballos, G. and Ehrlich, P.R., 2002. Mammal population losses and the extinction crisis. Science, 296(5569), pp.904-907. Estrada, A., Garber, P.A., Rylands, A.B., Roos, C., Fernandez-Duque, E., Di Fiore, A., Nekaris, K.A.I., Nijman, V., Heymann, E.W., Lambert, J.E. and Rovero, F., 2017. Impending extinction crisis of the world's primates: Why primates matter. Science advances, 3(1), p.e1600946.
30525	112	1	112	8	needs to include cultural heritage within ecosystem services, cultural services. [Hannah Fluck, United Kingdom (of Great Britain and Northern Ireland)]	Table 7.1 extension has cultural heritage covered. Box has been revised.
10515	112	4	112	4	What does "see above" refer to? [Jean-Luc Chotte, France]	Accepted. Language has been clarified.
2019	112	4	112	5	In Table 1, if using UK English spelling it should be "fibre". [William Lahoz, Norway]	We have made the correction
25725	114	11	114	11	This Cross-Chapter Box 8 should also cover modern uses of biomass, in addition to traditional biomass uses. As a clarification, it should be specified in the title that this box refers to biomass used for energy (not for food etc.). Here is a very recent reference that should be used: - Valade, A., Luyssaert, S., Vallet, P., Djomo, S. N., Van Der Kellen, I. J., & Bellassen, V. (2018). Carbon costs and benefits of France's biomass energy production targets. Carbon balance and management, 13(1), 26. [, France]	Rejected, as this box addresses traditional biomass; modern bioenergy is covered in a separate cross-chapter box as well as in various sections of Chapter 4, Chapter 6 and Chapter 7.
40131	114	11	116	44	Cross-Chapter Box 8 is important and points from this discussion could be elevated into the SPM -- especially the last sentence in the box which notes that the traditional biomass sector is under-researched and under-exploited in relation to cost-effective emissions reductions and synergies with the SDGs. The text in the box should be reviewed to ensure that sources are cited for each claim that is made. The subheading on "Food Security and other SDGs" should be revised to "Relationship to Food Security and other SDGs." The authors may wish to consider elevating the subsection on land degradation and deforestation within the box. [, United States of America]	Accepted, and re-organised the text

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
40921	114		116		Where does info in table 1 come from? Literature cited? Confidence level? On page 116, introduce LPG and assess mitigation implications of switch from traditional biomass to LPG compared to low carbon solutions. Statement on line 24-25 (global GHG emissions of traditional woodfuels) relevant for ES of chapter and SPM. Interplay with demography missing. [Valerie Masson-Delmotte, France]	The table has been removed since the information is now largely contained in the text.
24817	114	11	117	22	Box 8. Similar to box 7, the content of this cross chapter box on biomass promises what it does not (yet) deliver. What it sets out to do is show how land-climate interactions affect traditional biomass use. This has not (yet) been done clearly in box 8, which right now describes how climate affects biomass (discussed extensively already in Chapter 2, so think about the value added of this cross chapter box to target repetitions and what can be deleted). [Justice Issah Musah Surugu, Germany]	Accepted, have re-organised and re-labeled to reflect that the Box shows the implications of traditional biomass for land use, climate and development.
24819	114	11	117	22	Box 8: RECOMMEND LITERATURE TOP 2018 articles [Justice Issah Musah Surugu, Germany]	have included several more recent citations
12379	115	1	115	2	Suggest to provide an example of fNRBs. [Hans Poertner and WGII TSU, Germany]	Have removed the table because these issues have been covered in the text.
32581	115	21	115	22	"The scarcity of woody biomass can affect nutrition as rural populations are more likely in such cases to cook foods inadequately, which is often less healthy according to traditional diets". This is a view that is not supported with references. This sentence undermines both traditional cooking methods and processes such as soaking, germinating, malting, thermal processing, mechanical processing, soaking, fermentation, and germination/malting etc., that are known to enhance the bioavailability of micronutrients in plant-based diets (Hotz and Gibson, 2007). Traditional Food-Processing and Preparation Practices to Enhance the Bioavailability of Micronutrients in Plant-Based Diets. Christine Hotz Rosalind S. Gibson. The Journal of Nutrition, Volume 137, Issue 4, 1 April 2007, Pages 1097–1100 [Neeraja Havaligi, United States of America]	Accepted, and have removed this sentence.
12381	115	26	115	27	Suggest to add references to the table. [Hans Poertner and WGII TSU, Germany]	Have removed the table because these issues have been covered in the text.
2021	115	27	115	28	In Table 1, under Rural Development: jos -> job. [William Lahoz, Norway]	Table is removed.
33773	116	24	116	30	Quotation: "The use of traditional woodfuels (fuelwood and charcoal) contributes 1.9-2.3% of global GHG emissions due to the effects of overharvesting along with the effects of short-lived climate pollutants (Bailis et al. 2015). This estimate is conservative for traditional biomass overall, as it only includes woody biomass and does not account for losses in soil carbon or the effects of nutrient losses from use of animal dung. Of particular interest among short-lived climate pollutants that have near-term scope for mitigation are emissions of black carbon, which not only contributes to climate forcing but is also correlated with negative health impacts that affect especially women and children". Question: Is regrowth of woody biomass included in these numbers? Some of the traditional woodfuels can also be based on sustainable harvest of firewood? Short lived climate pollutants like BC from biomass burning will be followed by organic carbon (OC) emissions that in a longer timespan will act as cooling agents. Is this effect included in the numbers? What kind of metric is used for claiming that 1,9-2,3 % of global GHG emissions are partly a result of SLCP? GWP10? [, Norway]	Accepted, however, the estimation methodology cannot be explained in detail due to space limitations, the reviewer/reader would have to see the Reference, but some additional references have been added with relation to such estimates.
18253	116	35	116	38	sentence structure [Julia Nabel, Germany]	corrected.

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Comment No	From Page	From Line	To Page	To Line	Comment	Response
25727	117	1	117	1	This FAQ is very incomplete and should be based more on the FAQs of previous reports, including SR15. In particular, here are some suggestions of questions that should be added: - What are the connections between sustainable development and land-climate challenges of food security, desertification and land degradation? - What challenges does climate change pose to decision-making and governance of climate-land interactions? - What are the risks raised by climate-land interactions and how can they be addressed in adaptation and mitigation strategies? [France]	This FAQ is now not the only one for Ch.7 but is joined by a new FAQ on "What are the main opportunities and barriers to land-based responses to climate change?"
27429	117	1	117	22	It would be more interesting to ask this question in a broader way, i.e. "How can different forms of knowledge inform land-based mitigation and adaptation options?" The answer could contain the current text on ILK but also emphasize the broader importance and advantages of science based climate policy drawing on the rich information of chapters 6 and 7. [, Germany]	This FAQ has been allocated to the chapter by the TSU, alongside a new FAQ on "What are the main opportunities and barriers to land-based responses to climate change?"
40133	117	1	117	22	The FAQ box should include some positive examples of the concepts presented. [, United States of America]	Such examples have now been included
30527	117	1	117	22	include cultural heritage and the role that historic environment can contribute. US Natinoal Park Service publicaiton onf cultural heritage cliamte change strategy is a good example. [Hannah Fluck, United Kingdom (of Great Britain and Northern Ireland)]	Cultural heritage issues have now been recognised at various points in the chapter -we did not feel they should be included in this FAQ
40923	117		117		What about exchanges between ILK and science knowledge on causes for global warming, implications, projections? How to integrate that into values and visions of the world? Key challenge for climate literacy and education. [Valerie Masson-Delmotte, France]	This issue is now covered in the FAQ and at greater length in the new Cross-Chapter Box
3777	117	1		22	The importance of organizing joint processes of co-production of new knowledge between science and society is not sufficiently discussed here. Indigenous and especially local knowledge systems are not some exotic things, but contextualised knowledge, i.e. knowledge on socioeconomic and ecological status and dynamics as well as strategies that f it into actors' livelihoods. To integrate this knowledge (incl. values etc.) in joint processes secures best the development of adaptive, just, legitimized new strategies. [Cordula Ott, Switzerland]	This issue is now covered in the FAQ and at greater length in the new Cross-Chapter Box
3779	117	1		22	This Chapter is a bit weak, but in several places, the issue is discussed more broadly. (see Chapter 3, p.9, for example.) This should be not the only one and final FAQ... as somehow it is also a summary of the whole Chapter, or at least an emphasize on a most important issue.. [Cordula Ott, Switzerland]	The text that now underpins this FAQ is now a Cross-chapter box worked on by authors from 6 chapters. The FAQ is now not the only one for Ch.7 but is joined by a new FAQ on "What are the main opportunities and barriers to land-based responses to climate change?"
24339	139	6	139	6	Fra.Paleo, U. (editor). 2015. Risk governance. The articulation of hazard, politics and ecology. Dordrecht: Springer. [Urbano Fra.Paleo, Spain]	References will be properly formatted before publication
8745	149	17	149	25	The title of this reference was given repeatedly. [Changxiao Li, China]	References will be properly formatted before publication
10517	194	4	194	4	drylands and non-drylands are not separated in the figure; soil erosion and veg changes are, so it is not clear how this table maps to the figure. [Jean-Luc Chotte, France]	Copyedit to be completed prior to publication.
32583	197		197		"To be completed" High to very high ? [Neeraja Havaligi, United States of America]	confidence level now assigned
2007	: N2O (0 rep	2	83	2	I suggest the authors increase the font of the text in the blue circles in Fig.7.8. [William Lahoz, Norway]	Accepted. Revised.
32879					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]	Noted. This section has been submitted for consideration in the SPM.

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32899					Dooley, K et al. (2018) Missing pathways to 1.5C: the role of the land sector in ambitious climate action. Climate Land Ambition and Rights Alliance. Available from: climatelandambitionrightsalliance.org/report [Doreen Stabinsky, United States of America]	Noted. Reference considered, however, unclear where the reference is suggested to be input into chapter.
6645					The policies identified should address the current problems but it is important to consider their implications in the near future as well as in the medium and long term. [, Mexico]	Accepted. Consideration of policy over time elaborated in 7.7.3 and the dynamic nature of adaptive climate governance over time. SPM figure 4 links policies with future climate change scenarios.
6647					It is important to understand the concept of risk as a complex concept and from a holistic perspective. A risk is constructed as experiences, emotions, attitudes and knowledge. [, Mexico]	Thank you. This comment has been taken into account in the revisions. Note that because risk is addressed at a high level and not so much at an individual perceptive level, more emphasis in section 7.2 and 7.3 had been put on concepts at a meta level.
6649					Institutions can play a key role in adaptation as they could influence the social distribution of vulnerability and constitutes an important part of the adaptive capacity. It's decisive that the communities take ownership of their territory and the adaptation measures to make them better. It's really important to inform and train communities. [, Mexico]	Accepted. Participation and stakeholder involvement in decision making and governance is referred to in many sections and specific sections on participation appear in 7.7.
6651					Decision making in politics is very complex issue and hardly it will satisfy all involved parts, it is essential to prioritize taking account all sectors that could be affected in those decisions. [, Mexico]	Accepted. Integrating decision making in governance across sectors is described in 7.7.2
6653					It is clear that biodiversity has an important role in the provisioning of the ecosystem services, however the approach about research and policy in the context of ecosystem services is confusing. [, Mexico]	Accepted. Section 7.5.6.2 on conserving biodiversity and ecosystem services is clarified.
6655					Despite the text focuses on the risk for urban populations due to climate change, The World Health Organization (WHO) mentioned that all kind of populations (rural, coastal, etc.) will be affected by climate change, even though some are more vulnerable than others. Particularly people living in small island developing states and other coastal regions, megacities (as already mentioned), and mountain and polar regions. In addition, WHO considers children and elderly people as highly vulnerable, as well as places with poor infrastructure. [, Mexico]	Noted. Information on urban populations has been placed in a cross chapter box as a case study (as space doesn't permit all types of populations to be covered). Certain types of dwellers are covered in land tenure section/box.
6657					Topic 7.3.3.1 "Risk associated with land-based adaptation" is relevant issue for INECC, in this sense, is important to consider that the described risks are underestimated in the described climate adaptation scenarios. [, Mexico]	Thank you. This comment has been taken into account in the revisions.
6659					It was mentioned that the cost of mitigation and adaptation plans are, in general terms, less than the cost of the damages that climate change will cause, but it should be analyzed taking into account of the differences between countries and regions with different development levels and keeping in mind that most of the countries mentioned do not have the infrastructure, economical and human resources needed for research and investment in adaptation and mitigation measures. [, Mexico]	Thank you. This comment has been taken into account in the revisions, particularly in a cross chapter box on economics and dimensions of value. Note that parts of the reviewer suggestion either are not yet represented in the literature or may go beyond the scope of the assessment. To the degree reflected in the literature, those costs are brought in which are represented in peer review literature.
40135					Chapter 7 is nearly three times the allocated length, and it shows. The chapter lacks focus, frequently departs from the scope agreed by the IPCC for the report and the chapter, and contains numerous sections of narrow academic interest that are not specifically connected to the subject of the report. It's challenging for a reader to pick out the relatively few useful kernels in this fairly voluminous chapter. The chapter should be revised in a rigorous and disciplined way to cut out extraneous text that is not absolutely critical to the topic of the overall SRCLL. [, United States of America]	Accepted. Chapter will be reduced to proper page limits. Where comments have been made referring to specific sections responses are provided.
40137					Several sections of this chapter contain poor syntax, which makes the interpretation of the text challenging or diminishes its readability. [, United States of America]	Accepted. Review and copyedit to be performed.

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30519					needs to identify loss of cultural heritage resource - archaeological sites, buildings, places, monuments, landscapes etc which are integral to the land and environment in many areas. [Hannah Fluck, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Cultural assets is recognized as part of definition of risk in glossary.
12521					Risks to biodiversity have not been considered but should be included in the ES. [Hans Poertner and WGII TSU, Germany]	Thank you. This comment has been taken into account in the revisions.
12523					ES has been distilled to a more theoretical level but specifying examples, quantifying risk thresholds, adaptation measures and limits in relation to climate scenario would provide improved access and better intuitive understanding, as well as provide a stronger message. [Hans Poertner and WGII TSU, Germany]	Accepted. Chapter 7 has contributed to SPM figure 4 linking policies to climate scenarios.
24805					When moved to section 7.5, the India case study requires a sentence is needed to link the case study with the entire section). The case study should bring out the policy trade-offs more. Help the reader understand the upsides and downsides of green growth, public acceptance, the "ins and outs" of the policy approach India is taking supported by references. [Justice Issah Musah Surugu, Germany]	Noted. This case study has been moved to 7.6.6 and rewritten.
4109					Provide further assessment on tradeoffs of mitigation measures and decarbonisation of economy on enabling capacities for land management and competition for BECCS; [Noureddine Yassaa, Algeria]	Accepted. Synergies and Tradeoffs section has been developed further.
4113					My general comment for this chapter is what are the potential response options? while it is clear the land related options to mitigate further climate change, it is not clear what are the potential response options that can help avoiding land degradation and desertification and securing food in the context of global warming. Also, Adaptation and mitigation options have to be addressed in a balanced way. It will be nice to have a figure for adaptation options. It will make more sense to state somewhere the costs of response options. [Noureddine Yassaa, Algeria]	Rejected. The response options are covered in chapter 6. Policies supporting response options covered in chapter 7.
4115					Adaptation options need to be elaborated further. Water is a very important element that is heavily affected by global warming. To achieve synergies with SDG, adaptation options should include rational use of water in agriculture. Desalination and demineralization options are also used to adapt to water scarcity in many (semi) and arid regions. How about intensive use of ground and non renewable water because of low precipitations, for agriculture use. [Noureddine Yassaa, Algeria]	Rejected. Chapter 2 has covered some relations of climate change, land, and water. Chapter 7 has covered policies responding to drought and agriculture.
4117					technology and knowledge transfer, lessons learned sharing, and international collaboration,...are very important for sustainable land management and need to be elaborated further. [Noureddine Yassaa, Algeria]	Accepted. Technology transfer found in 7.5.4.5
4119					Capacity building, technology and knowledge transfer, lessons learned sharing, and international collaboration,...are very important for sustainable land management and need to be elaborated further. [Noureddine Yassaa, Algeria]	Accepted. Technology transfer found in 7.5.4.5
11617					GPCA (2014). A New Horizon for the GCC Plastic Processing Industry, Gulf Petrochemicals & Chemicals Association & Nexani, pp9, accessed 10/10/2017 at http://gpca.org.ae/wp-content/uploads/2015/01/GPCA_A_New_GCC_Plastic_Processing_Industry_report_2014_web.pdf (Link no longer available); Renwick Danielle (2018). Venezuela in Crisis. Website article accessed 13/1/2019 at https://www.cfr.org/backgrounder/venezuela-crisis . [Paul Dumble, United Kingdom (of Great Britain and Northern Ireland)]	Noted and considered for addition.

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40141					<p>Alexandratos, N, and J Bruinsma. 2012. "World Agriculture towards 2030/2050: The 2012 Revision." ESA Working paper No. 12-03. Rome: FAO.</p> <p>Bajželj, Bojana, Keith S. Richards, Julian M. Allwood, Pete Smith, John S. Dennis, Elizabeth Curmi, and Christopher A. Gilligan. 2014. "Importance of Food-Demand Management for Climate Mitigation." <i>Nature Climate Change</i> 4 (10): 924–29. https://doi.org/10.1038/nclimate2353.</p> <p>Chum, Helena, Andre Faaij, José Moreira, Göran Berndes, Parveen Dhamija, Hongmin Dong, Benoît Gabrielle, et al. 2011. "Bioenergy." In IPCC Special Report on Renewable Energy Sources and Climate Change Mitigation, edited by O Edenhofer, R Pichs-Madruga, Y Sokona, K Seyboth, P Matschoss, S Kadner, T Zwicker, et al. Cambridge, United Kingdom and New York, NY, USA: Cambridge University Press.</p> <p>Cintas, Olivia, Göran Berndes, Annette L. Cowie, Gustaf Egnell, Hampus Holmström, Gregg Marland, and Göran I. Ågren. 2017. "Carbon Balances of Bioenergy Systems Using Biomass from Forests Managed with Long Rotations: Bridging the Gap between Stand and Landscape Assessments." <i>GCB Bioenergy</i> 9 (7): 1238–51. https://doi.org/10.1111/gcbb.12425.</p> <p>Evans, Samuel G., Benjamin S. Ramage, Tara L. DiRocco, and Matthew D. Potts. 2015. "Greenhouse Gas Mitigation on Marginal Land: A Quantitative Review of the Relative Benefits of Forest Recovery versus Biofuel Production." <i>Environmental Science & Technology</i> 49 (4): 2503–11. https://doi.org/10.1021/es502374f.</p> <p>Fargione, J., J. Hill, D. Tilman, S. Polasky, and P. Hawthorne. 2008. "Land Clearing and the Biofuel Carbon Debt." <i>Science</i> 319 (5867): 1235–38. https://doi.org/10.1126/science.1152747.</p> <p>Gibbs, Holly K., Matt Johnston, Jonathan A. Foley, Tracey Holloway, Chad Monfreda, Navin Ramankutty, and David Zaks. 2008. "Carbon Payback Times for Crop-Based Biofuel Expansion in the Tropics: The Effects of Changing Yield and Technology." <i>Environmental Research Letters</i> 3 (3): 034001. https://doi.org/10.1088/1748-9326/3/3/034001.</p> <p>Griscom, B.W. 2017. "Natural Climate Solutions." <i>PNAS</i> 114 (44): 11645–50.</p> <p>Haberl, Helmut, Detlef Sprinz, Marc Bonazountas, Pierluigi Cocco, Yves Desaubies, Mogens Henze, Ole Hertel, et al. 2012. "Correcting a Fundamental Error in Greenhouse Gas Accounting Related to Bioenergy." <i>Energy Policy</i> 45 (June): 18–23. https://doi.org/10.1016/j.enpol.2012.02.051.</p> <p>Myers, Norman, Russell A. Mittermeier, Cristina G. Mittermeier, Gustavo AB Da Fonseca, and Jennifer Kent. 2000. "Biodiversity Hotspots for Conservation Priorities." <i>Nature</i> 403 (6772): 853–58.</p>	<p>Noted. This reference contains a very high level analysis of food security more applicable for Chapter 5. Consideration given to including it in synergies and tradeoffs, however, it is not peer reviewed literature. Bioenergy and BECCS; much of the literature mentioned here relates to accounting principles and impacts rather than risk management and governance and therefore is generally out of scope for this chapter.</p>

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8729					<p>This chapter identifies the risks associated with climate-land change interactions, analyzes the consequences of climate-land change interactions on human well-being and sustainable development, and proposes policy responses, decision-making, and governance for the above risks.</p> <p>In general, when conducting a risk analysis, the following processes should be followed: risk identification, the type and extent of risk impact, the decisions need to be considered to cope with these risks, and how to make and implement those decisions.</p> <p>This chapter basically follows the above principles concerning the structure and specific content, but the following improvements are still needed in the logic and details:</p> <p>In terms of the structure of this chapter:</p> <p>(1) The title of this chapter is risk management and decision making in relation to sustainable development, but the full text is discussed from the perspective of climate-land change. Therefore, it is recommended that the authors limit the topic of this chapter to the context of climate-land interaction.</p> <p>(2) Section 7.4 discusses the consequences of climate-land change risk. The content of this section is closely related to Section 7.3. Therefore, it is recommended that the authors combine the contents of these two sections into one section to specifically address the identification of risks and their impacts, making the chapter more compact.</p> <p>(3) This chapter does not explicitly discuss the relationship and differences between the concepts of governance (in Section 7.7) and the decision-making (in Section 7.6). Section 7.7 is one of the essential sections. But its contents are not reflected in the title of this chapter. Besides, the contents in section 7.7 are slightly confusing. They cannot reflect the hierarchical relationship clearly. It is recommended that the authors reorganize the logical relationship of this section.</p> <p>In terms of the contents of this chapter:</p> <p>(1) Do the policy responses to desertification and land degradation require separate subsections in Section 7.5? Also, there are many introductions to the economic policy responses. Can other types of policies be supplemented?</p> <p>(2) The boundaries of the classification of policy responses in Section 7.5 are not clearly defined, and there is a clear inclusion relationship between the objects targeted by various policies, and the authors do not effectively elaborate on this inclusion relationship. In addition, the policy responses discussed by the authors do not fully cover all of the policy responses needed to cope with climate-land interaction risks.</p>	<p>Noted. This is an accurate description of the chapter. Linkeage between sections has been expanded and honed to explain. 7.5 has been clarified in relation to desertification and degradation in the title. Governance is in the indicative bullets of the chapter requirements.</p>