

#	Ch	From Page	From Line	To Page	To Line	Comment
1	20	0	0	0	0	A valuable chapter, well structured and supportive for decision makers. Examples of Climate Resilient Pathways should be included with specific referral to measures, actions, approaches and assessment if any, of their capacity to deliver results. (Constantinos Cartalis, Environmental Physics, University of Athens, Greece) (GREECE)
2	20	0	0	0	0	The chapter is written professionally and the argumentation is reasonable although supporting evidence is in many cases limited as the writers acknowledge. The findings are robust and clearly stated. (Silvo, Kimmo, Finnish Environment Institute)
3	20	0	0	0	0	An element that I would like to see more emphasized in the chapter is the role of experiments, trials and pilot projects in opening climate-resilient pathways in mitigation as well as incremental or transformational adaptation. The experimenting could be related to activities on different levels e.g. sustainable energy production, transportation systems and techniques, housing solutions, food production and consumption patterns as well as sustainable life styles. The public sector could provide the institutional framework for funding and encouragement of such pilot projects and trials that from private enterprises' and individuals' viewpoint often involve risk elements. (Silvo, Kimmo, Finnish Environment Institute)
4	20	0	0	0	0	Effective communication of socially acceptable and successful steps on climate-resilient pathways on different areal scales is also an important aspect in social learning that could be highlighted in the text. (Silvo, Kimmo, Finnish Environment Institute)
5	20	0	0	0	0	In general, this Chapter does not appear to be well thought through and appears to be based on personal anecdotal evidence. In its current form it is not of a high enough standard to be published. This is supported by the lack of clear reference to the scientific literature and the limited use of real world examples. In essence this one Chapter sums up the lack of transferability between the academic discourse, the policy discourse and the operational parameters of delivering effective and meaningful climate resilience at an organisational scale. There is little quantitative evidence within the Chapter and few practical examples, it appears that the chapter is based upon hypothetical arguments and submissions. There are too many references to previous IPCC reports, references need to be made to the specific papers (this is an undergraduate type error). I hope to provide some examples below. (Viner, David, Private)
6	20	0	0	0	0	This chapter brings together climate change impacts, adaptation and mitigation and relates this sustainable futures and resilience. It is a good overview of the measures that could be taken and their possible implications. It is very important to notice that there are many uncertainties and unknowns related to the development of climate resilient development pathways. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
7	20	0	0	0	0	The Chapter does highlight co-benefits between mitigation, adaptation and sustainable development, however, does not make the link very explicit. The language seems explicitly weak when mentioning that in some cases traditional development patterns might need to be challenged. The report continues to state that the lines between sustainable and business as usual development are blurred, which seems to be an exaggeration, there is enough evidence that business as usual development especially in developing countries will not lead to sustainable development nor mitigate dangerous climate change. At last the report should be able to provide clarification in this issue instead of overemphasizing the lack of clarity. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)

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8	20	0	0	0	0	Critical development literature e.g. Mosse „cultivating development“ should be included. It should be stressed more that decoupling of emissions from development is important and contributes to both mitigation and sustainable development and hence is a no regret strategy. The scientific consensus that delaying action will increase risks to sustainable development greatly should be quoted in the introduction as well as taken up in the SP and TS. consensus between science and practice on page 25 should be featured more prominently including in the TS and SP (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
9	20	0	0	0	0	The chapter on climate resilient pathways should be better interlinked to the respective chapter of WG III (Transformation Pathways). Some relevant literature relating development via HDI and emission reduction pathways under consideration of the 2 degree target is missing here. Exactly this work can help to make links clear between development and growth targets (cf. for example Costa et al. 2011: A human development framework for CO2 reductions, PlosOne 6(12):e29262). Moreover more country specific approaches are needed in order to make clear benefits or shortcomings for the countries in case of concrete transitions. A lot these things remain quite vague. But challenges on the interface between WGII and WGIII are often not discussed adequately (not only in this chapter!). Might be that the current organisation of IPCC reports are no longer adequate. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
10	20	0	0	0	0	The chapter has 272 references, out of which 38 (14%) are from the chapter authors. (INDIA)
11	20	0	0	0	0	Out of these 272 references, only 15 (6%) are on developing countries. It is suggested that a more balanced approach could be adopted. (INDIA)
12	20	0	0	0	0	A quick check on the total universe of articles in peer-reviewed journals since AR4 (2007) indicates that there are almost 1100 in journals of Science Direct, 400 in Francis and Taylor, 1000 in Wiley and 200 in JSTOR totaling to around 2800 articles in all on topic covered in this chapter. The chapter has captured almost 10% of existing literature. (INDIA)
13	20	0	0	0	0	Out of total 2800 articles mentioned as above, almost 1100 are on developing countries (around 40%) and issues related to them. It indicates that there is a large enough pool of articles to be picked up on developing countries to be cited in this chapter. The authors may like to take a look at it. (INDIA)
14	20	0	0	0	0	Chapter 20 discusses how to develop climate-resilient pathways for socioeconomic development of societies. These pathways are evolutionary, iterative processes that enable societies to develop in the face of climate change threats by identifying the vulnerabilities towards these threats, trying to reduce them as much as possible, and seeking new ways of reducing the vulnerabilities. Lessons learnt are noted, and the entire process is repeated cyclically to a particular instance of a Climate Resistant Pathway (CRP). \n\nThe chapter reveals that there are many such pathways possible. A pathway can be strengthened by its capacity to foresee risks, reduce climate change impacts, and respond speedily to unpredictable extreme events while progressing social development in an environmentally responsible way. \n\nActions to frame CRPs may occur at both global/national as well as local scales. The development of CRPs may sometimes require transformational changes. Shared Socioeconomic Pathways (SSPs), consisting of alternative mixes of actions that take into account economic and institutional resources available at the local and national scales, provide one strategy for that support climate resilient pathways that are acceptable (i.e. lie within the “boundaries of the envelope of climate resilience). Five such pathways have been identified. These may be related to Representative Concentration Pathways (RCPs) that depend on different levels of climate change due to radiative forcing. \n\nThe chapter accepts that climate change is here, and acknowledges that it is caused in part by socioeconomic development. It outlines how we can deal with its impacts on the socioeconomic development of societies in situations where the change is manageable and those where it is extreme. (Singh, Anirudh, University of the South Pacific)

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15	20	0	0	0	0	This is a well-constructed, well-organized chapter that does what it set out to do. However there is some concern about the level of the discussion. This may be a bit too abstract at times for the general readership, and especially decision-makers. It seems to be directed more at the academic who is schooled in the use of abstract language and terminology. \n\nA partial solution to this perceived problem is to intersperse the text with concrete-operational examples to reduce the "fog index" and improve the readability for the general reader. (Singh, Anirudh, University of the South Pacific)
16	20	0	0	0	0	General comment to the chapter: I would recommend to have a more systemic approach in the chapter. You mention that considering CCA and CCM in the context of SD implies a complex system, but you don't specify what that means and implies. What are the system boundaries? What do we know about the linkages/relations/adaptive behaviour in the system (please be aware that the term "adaptive behaviour" in this sentence is not meant as adaptive to climate change)? Some literature in complex systems and hierarchical complexity could be used as basis for presenting such a systemic approach. (Robledo Abad, Carmenza, HELVETAS Swiss Intercooperation)
17	20	0	0	0	0	General comment to the chapter: I would expect many cross-references to the framing and to the sectoral chapters from WGIII. To the framing chapters especially regarding risk management, SD and ethics. To the sectoral chapters because in each sectoral chapter in WGIII a subsection on the links between mitigation and adaptation is included. This shall be clear reflected in this chapter of WG II (Robledo Abad, Carmenza, HELVETAS Swiss Intercooperation)
18	20	0	0	0	0	Comment on the executive summary: Although the chapter has very interesting sections the summary is rather vague and don't bring much new knowledge.... That is a pity! I would propose that you make the ES sharper and highlight the new ideas and new findings (Robledo Abad, Carmenza, HELVETAS Swiss Intercooperation)
19	20	0	0	0	0	It should be useful to agree on an understanding of "sustainable development". Refer to WGIII Chapter 4 on Sustainable Development and Equity and secure an homogenous understanding of these key concepts across WGII and WGIII (Robledo Abad, Carmenza, HELVETAS Swiss Intercooperation)
20	20	0	0	0	0	There is a lot of research and experiences in mainstreaming adaptation into development and development cooperation. Perhaps the authors can find better examples for the chapter if they look into the evaluations of such cooperation activities (contact e.g. GIZ, SDC or WinRock) (Robledo Abad, Carmenza, HELVETAS Swiss Intercooperation)
21	20	0	0	0	0	Please see our comments on the SPM with regards to the concept of 'climate resilient-pathways'. (GERMANY)
22	20	0	0	0	0	The Chapter is well written, coherent and covers almost all parts pertaining to climate resilient pathways that is adaptation and mitigation for sustainable development (Goheer, Arif, Global Change Impact Studies Centre (GCISC))
23	20	0	0	0	0	The confidence is described in an inconsistent manner. For example, in the ES are found "moderately high confidence", "medium high agreement" etc. It is suggested to make modifications according to the Guidance Note for Lead Authors of the IPCC Fifth Assessment Report on Consistent Treatment of Uncertainties (6-7 July 2010). (CHINA)
24	20	0	0	0	0	General comment: the idea of "climate resilient pathways" is based on a UN report (see p. 4 of Chapter 20). Chapter 20 does not show that the idea of "climate-resilient pathways" is drawn from the review of the academic literature. \n\n (NETHERLANDS)
25	20	0	0	0	0	The IPCC should consider developing products that are written in the vernacular of society. The terminology employed by this document is often unapproachable and vague to the point of inaccessible. (UNITED STATES OF AMERICA)
26	20	0	0	0	0	There is a bit of an overfocus on built environment adaptation, with little recognition that good "development" adaptation will require integrating natural environment, agriculture and social adaptation as well. (UNITED STATES OF AMERICA)

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27	20	0	0	0	0	This chapter is, as the authors clearly state, on the frontiers of what can be stated based on documented experience and the literature. The primary critique of this chapter is a lack of clarity in a number of cases, and most of this may be the overuse of certain terms that may be clear to the authors, but that unfortunately do not communicate well. "Sustainable development", though in the chapter title, is nevertheless overused to such an extent that it makes many statements too vague to be useful. The chapter is most clear when it introduces a concept followed by a real-world example; the chapter is at its weakest when it presents lengthy discussions with no examples.\nIn many cases, there should be greater clarity where industrialized vs. developing country contexts are being discussed. In some cases, there are very lengthy paragraphs that make it difficult to ascertain the salient points. Sections 20.4.2 and 20.5.1 are especially problematic in this regard. (UNITED STATES OF AMERICA)
28	20	0	0	0	0	1) Already IPCC IV AR cope with the issue of climate change and sustainable development. Authors should make clear which are, if any (authors made a lot of effort in analysing the most recent and influent literature), the main improvements with respect to the previous IPCC IV report (ITALY)
29	20	0	0	0	0	2) The whole chapter is more oriented to highlight the theoretical structure of the issue authors are writing about. Only a few times they report examples on best practices from the real world. I think authors should have made an extra-effort in report more tangible examples of climate resilient experience throughout the world (ITALY)
30	20	0	0	0	0	3) linked to the previous comments, reading the chapter sometimes is quite uneasy given so many theoretical details. Sometimes concepts are repeated (my comment p. 26 rows 27-30) and do not appear immediately clear. Only eventually at paragraph 20.7 I have a very clear perception of what is proposed by authors. (ITALY)
31	20	0	0	0	0	4) I would have expected more linkages with Rio+20 main achievements, including discussion on indicators to monitor progress towards sustainable development (including environmental performances) as a useful tool to help policymaking (see for instance issue brief n. 6 (http://www.uncsd2012.org/index.php?page=view&type=400&nr=218&menu=45) and Principle n. 250 in the final document (http://www.uncsd2012.org/content/documents/814UNCSD%20REPORT%20final%20revs.pdf) (ITALY)
32	20	0	0	0	0	The chapter is well written, succinct and coherent. There is good reference to other chapters too. I consider this chapter to be setting the scene for developing long term solutions to climate change challenges across-scales i.e. making deliberate choices for Climate-Resilient Pathways. The chapter makes it clear that to tackle climate change we need to integrate information from all the traditional IPCC three working groups and move further and beyond through sustainable development into uncharted territory. The section on Priority Research/Knowledge Gaps shows very clearly that this is still a pioneering area. There is tremendous work yet to be done. To me the chapter points to a new realization – that is, the need for the birth of IPCC Working Group IV. A separate working group will facilitate growth in research and create more attention on Climate-Resilient Development Pathways. (Dube, Pauline, University of Botswana)
33	20	0	0	0	0	This Chapter requires considerable revamping and improvement on the following lines: it is very important that the concept of sustainable development (attributed to WCED 1987 Report) is produced in its entirety and not in fragments - a mistake very often committed in literature and policy making, and the root cause of several policy gaps. The definition must be quoted from the source at page 43 as: " Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts of 'needs', in particular the essential needs of the world's poorest, to which overriding priority should be given; and the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs." For more details and applications see P. K. Rao, 2000, Sustainable Development: Economics and Policy, Oxford: Blackwell. (Pinninti, Krishna Rao, Rutgers University)

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34	20	0	0	0	0	An important ingredient missing in this Chapter is the role of governance, as it has an extremely critical role in the design and implementation of climate-resilient pathways that integrate adaptation, mitigation and sustainable development. A cost-effective common underlying mechanism in this context is the role of institutions, their quality, and adaptive governance. It pays to offer key insights in this regard, and we have a good deal of understanding on these integrative aspects. (Pinninti, Krishna Rao, Rutgers University)
35	20	0	0	0	0	Finally, and very importantly, this Chapter must recognize the roles of win-win-win strategies in suggesting relevant pathways, and these take various highly inter-related routes: inclusive green growth, pro-poor growth policies that are climate-resilient, inclusive sustainable development, and green economic policies; see also P. K. Rao, 2010, The Architecture of Green Economic Policies, Heidelberg: Springer Verlag. (Pinninti, Krishna Rao, Rutgers University)
36	20	0	0	0	0	Are there any evidence where climate change can help SD? Chapter 10, page 31, line 37 mention Fankhauser and Tol, (2005) as limited understanding how CC would affect growth and development. Some statement could address this question and reconcile the chapters. (de Campos, Christiano, Petroleo Brasileiro SA)
37	20	0	0	0	0	I would conclude from the chapter that adaptation in general promotes SD (except page 16 line 27/28), but mitigation not always (page 10 line 19 to 21, page 15 line 13 to 15 - IPCC SRREN 2012 chap 9), mainly in the medium term. Climate resilient pathways also improve SD and this include both. Can it be stated somehow in the executive summary? (de Campos, Christiano, Petroleo Brasileiro SA)
38	20	0	0	0	0	Funding the SD and adaptation could be linked to the climate-resilient pathways, maybe crosslinking with chapter 17. Mitigation has a established market, but adaptation not, and it is and will impact SD. The Adaptation Fund from UNFCCC could be explored in this chapter and alternatives as the Brazilian Proposal (1997) Clean Development Fund to UNFCCC. (de Campos, Christiano, Petroleo Brasileiro SA)
39	20	0	0	0	0	From this chapter I concluded that the main thread of CC to SD is food security, the chapter could include more references about this cross-linking with other chapters. (de Campos, Christiano, Petroleo Brasileiro SA)
40	20	0	0	0	0	The approach of climate responsibility period versus climate options approach could be further explored under SD perspective. (de Campos, Christiano, Petroleo Brasileiro SA)
41	20	0	0	0	0	The chapter 27, pag 24 line 9, brings a reference Baethgen (2010) that can be added to this chapter 20, since link adaptation practices to SD. (de Campos, Christiano, Petroleo Brasileiro SA)
42	20	0	0	0	0	Chapter 20 on climate resilient pathways fundamentally fails to analyse the importance of poverty reduction as a critical aspect of any climate resilient pathway for the poorest developing countries. This is a major weakness of that chapter that affects virtually all its conclusions and I have not had time to address these on a line by line basis. (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
43	20	0	0	0	0	The risks and potential impacts related to nuclear power plants, facilities and waste related to extreme events, coastal flooding, erosion, sea-level rise etc. should be described better in the executive summary as well as in the body of the chapter. Like (NORWAY)
44	20	0	0	0	0	The link between climate change and development needs to be further studied and explained (Sosa-Rodriguez, Fabiola S., University of Waterloo)
45	20	0	0	0	0	The idea/concept of sustainable development pathways needs to be further explained in the chapter. Although there is a section in the chapter that discuss this concept, several sections are not integrated to the discussion and do not contribute to understand what the authors mean by climate-resilient pathways, how countries can promote this pathways or which are their characteristics. More discussion is needed regarding this interesting concept. (Sosa-Rodriguez, Fabiola S., University of Waterloo)

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46	20	0	0	0	0	Since the theoretical framework used in this chapter to analyze sustainable development pathways and climate-resilient pathways is based on the theory of complex systems, interactions among systems (social and ecological) and stressors (e.g., mitigation, adaptation and development) needs to be included in the discussions of the chapter. (Sosa-Rodriguez, Fabiola S., University of Waterloo)
47	20	0	0	0	0	It is necessary to further explain the interactions between climate-resilient pathways and sustainable development, and why these pathways are essential for ensuring/promoting this type of development (Sosa-Rodriguez, Fabiola S., University of Waterloo)
48	20	0	0	0	0	Further discussion on (1) climate-resilient pathways and their interactions with mitigation, adaptation and sustainable development, and (2) attributes, characteristics, and challenges of climate-resilient pathways would improve the chapter (Sosa-Rodriguez, Fabiola S., University of Waterloo)
49	20	0	0	0	0	Other articles that could be useful for improving the chapter are: (Sosa-Rodriguez, Fabiola S., University of Waterloo)
50	20	0	0	0	0	1. Swart, R.; Raed, F. (2007). Making integration of adaptation and mitigation work: mainstreaming into sustainable development policies? Climate Policy (Sosa-Rodriguez, Fabiola S., University of Waterloo)
51	20	0	0	0	0	2. Goklany, I.M. (2007). Integrated strategies to reduce vulnerability and advance adaptation, mitigation, and sustainable development. Mitigation and Adaptation Strategies for Global Change (Sosa-Rodriguez, Fabiola S., University of Waterloo)
52	20	0	0	0	0	3. Robinson, J.; Bradley, M.; Busby, P.; Connor, D.; Murray, A.; Sampson, B.; Soper, W. (2006). Climate Change and Sustainable Development: Realizing the Opportunity. AMBIO: A Journal of the Human Environment, 35(1):2-8. (Sosa-Rodriguez, Fabiola S., University of Waterloo)
53	20	0	0	0	0	4. Handmer, JW.; Dovers, SR (1996). A typology of resilience: rethinking institutions for sustainable development. Organization & Environment (Sosa-Rodriguez, Fabiola S., University of Waterloo)
54	20	0	0	0	0	Chapter team should consider adding a box towards the beginning of the chapter to explain some of the specific concepts like climate resilience, global sustainability. (Chatterjee, Monalisa, IPCC WGII TSU)
55	20	0	0	0	0	Discussion in the chapter needs to be integrated to avoid repetition and improve flow. (Chatterjee, Monalisa, IPCC WGII TSU)
56	20	0	0	0	0	The use of climate resilient pathways in the chapter seems a little disjointed. Moreover sometimes it is not clear how climate resilient pathways interacts with sustainable development, climate change response or building of resilience. Although it is evident that these are interdependent there are gaps in explanation that make it confusing. (Chatterjee, Monalisa, IPCC WGII TSU)
57	20	0	0	0	0	The definition of sustainable development sometimes in the chapter seems narrow. (Chatterjee, Monalisa, IPCC WGII TSU)
58	20	0	0	0	0	The author team is strongly encouraged to further develop figures and tables to present key and synthesized findings where ever possible. (Estrada, Yuka, IPCC WGII TSU)
59	20	0	0	0	0	1) Overall -- The chapter team has developed a strong 2nd-order draft. In the final draft, the chapter team is encouraged to continue its prioritization of compact and rigorous assessment and clear writing. Below I summarize some overall themes the author team could consider further. (Mach, Katharine, IPCC WGII TSU)
60	20	0	0	0	0	2) Coordination across Working Group II -- In developing the final draft of the chapter, the author team should continue to ensure coordinated assessment, both in the chapter text and at the level of key findings. As appropriate, cross-references to the sections of other chapters and/or their assessment findings should be used, continuing to ensure that overlaps are reduced and assessment harmonized. (Mach, Katharine, IPCC WGII TSU)

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61	20	0	0	0	0	3) Harmonization with the Working Group I contribution to the AR5 -- In developing the final draft, the chapter team should also ensure all cross-references to the Working Group I contribution are updated, with discussion of climate, climate change, and climate extremes referencing the assessment findings in that volume. Additionally and importantly, the chapter team should consider opportunities for citing Working Group I findings in its introduction and discussion of climate change that is largely locked in over the next decades and of the range of projected levels of climate change later in the century, dependent on emissions trajectories. (Mach, Katharine, IPCC WGII TSU)
62	20	0	0	0	0	4) Figures and tables -- If reviewers of the second-order draft identify opportunities for adding figures or tables to enhance communication of the chapter's assessment, the chapter team is strongly encouraged to consider including them. (Mach, Katharine, IPCC WGII TSU)
63	20	0	0	0	0	5) Tightening the assessment and reducing overlap -- In the current draft of the chapter, there are opportunities for reducing overlap across sections. The chapter team is very much encouraged to consider opportunities for reducing redundancies across sections and thereby further honing the focus of each section. The traceable accounts for assessment findings would be even clearer and more effective if the reader could readily understand the origin of each. (Mach, Katharine, IPCC WGII TSU)
64	20	0	0	0	0	6) Report release -- The chapter team should be aware that the final drafts of the chapters will be posted publicly at the time of the SPM approval, before final copyediting has occurred. Thus, the chapter team is encouraged to continue its careful attention to refined syntax and perfected referencing. (Mach, Katharine, IPCC WGII TSU)
65	20	0	0	0	0	7) Characterization of future risks -- In framing future risks relevant to the determination of and choices about climate-resilient pathways, the chapter team may wish to consider risks for what can be considered two eras. Some risks become relevant in the next few decades, during which time projected temperatures do not vary substantially across socioeconomic/climate scenarios. These coming decades can be considered an era of climate responsibility, and adaptation can be considered a primary means of reducing risks during this time. In contrast, mitigation choices made now and in the coming decades will be important in determining the level of climate change realized in the 2nd half of the 21st century and beyond. This longer-term period can be considered an era of climate options. Mitigation and adaptation are both relevant for risk reduction over this time frame. (Mach, Katharine, IPCC WGII TSU)
66	20	0	0	0	0	8) Informing the summary products -- To support robust and insightful summary products for the report, the chapter team is encouraged to maximize nuance and traceability in its key findings, continuing to use calibrated uncertainty language effectively. The chapter team is also encouraged to consider themes emerging across chapters, indicating for example how extreme events have demonstrated adaptation deficits and vulnerabilities and may relate to future risks, how limits to adaptation and transformation are relevant in the context of this chapter, how multidimensional inequality is relevant in the context of climate change, and of course how mitigation, adaptation, and sustainable development interact. (Mach, Katharine, IPCC WGII TSU)
67	20	0	0	0	0	GENERAL COMMENTS: I congratulate the author team for a well-written and informative SOD. Please see my detailed comments for suggestions related to specificity of ES findings and their traceable accounts, cross-chapter coordination, refining figures and tables, calibrated uncertainty language, and various specific clarifications. I have two general comments. First, the chapter needs a careful read to reduce overlap across sections, as currently it covers the same ground multiple times for several topics. I have tried to point some of these cases out in my specific comments. Second, the term "climate extremes and extreme events" or variations on it appears in a variety of places in the chapter, including the executive summary (page 3 lines 21-22). These are synonyms per the glossary, and it would be clearer to adopt one term that is used throughout to refer to this subject. In many such instances (see specific comments), a broader scope of impacts of climate change may be warranted (beyond just changes in patterns of climate extremes). (Mastrandrea, Michael, IPCC WGII TSU)

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68	20	0	0	0	0	SUMMARY PRODUCTS: In preparing the final draft of your chapter and particularly your executive summary, please consider the ways in which your chapter material has been incorporated into the draft SPM and TS. For chapter 20, this includes presentation of iterative management of risk in section B.i, principles for effective adaptation in B.ii, climate-resilient pathways and transformation in section D.i, and figures and tables associated with these sections. Are there opportunities for presenting chapter findings and material in a way that further supports broad themes highlighted in the summary products and that facilitates additional cross-chapter synthesis in specific findings or figures/tables? Do the existing summary product drafts suggest additional coordination that should occur between Chapter 20 and other chapters at LAM4? (Mastrandrea, Michael, IPCC WGII TSU)
69	20	0	0	0	0	So now we drag in the other buzzword, "sustainable development". It does not exist. There is either development or there is stagnation. (Gray, Vincent, Climate Consultant)
70	20	2	4	2	5	In terms of logis and coherency, It is recommended to swap questions 20.1 and 20.2 or even to integrate the two. (Garschagen, Matthias, United Nations University)
71	20	2	12	0	0	: It is not made very clear at the start of the chapter that CRPs are pathways for socioeconomic development of societies , and that emphasis is being placed on the effects of climate change on this development, rather than a study of climate change per se. \n\nThe word "socioeconomic" should occur more frequently at the early stages of this chapter. For instance, in the executive summary (page 2 line 14), the phrase "sustainable development" could be modified to " sustainable socioeconomic development". The phrase "climate resilient pathways" (page 2 line 29) could be replaced by "climate resilient pathways for sustainable socioeconomic development". (Singh, Anirudh, University of the South Pacific)
72	20	2	12	0	0	Executive Summary -- The chapter team effectively characterizes its degree of certainty in key findings using levels of confidence, as well as the corresponding basis for these assignments, in terms of its evaluation of evidence and agreement. For the levels of confidence and summary terms presented, the chapter team should preferably use only the modifiers provided in the uncertainties guidance for authors: very low, low, medium, high, very high confidence; low, medium, high agreement; limited, medium, robust evidence. (Mach, Katharine, IPCC WGII TSU)
73	20	2	14	2	27	It would be useful to clearly define what the authors mean by sustainable development pathways. There is an interesting definition that could be expanded in page 24. (Sosa-Rodriguez, Fabiola S., University of Waterloo)
74	20	2	14	2	43	I would suggest shortening this introductory text in the executive summary considerably, particularly given that much of the same material appears in section 20.1. (Mastrandrea, Michael, IPCC WGII TSU)
75	20	2	15	2	15	Statement says "climate-resilient pathways for development are evolutionary processes for managing change within complex systems". (Following the managerial perspective that change is a priori manageable in complex systems) the statement probably means to say: "climate-resilient pathways for development can be seen as evolutionary processes".\n\n (NETHERLANDS)
76	20	2	15	2	15	Is "evolutionary" the best word here? I struggle to suggest a perfect alternative--"adaptive," "iterative," or even "evolving" could be options. Although "evolution" certainly can pertain to cultures and society, I wonder if it would be most effective and clearest not to evoke it so directly. (Mach, Katharine, IPCC WGII TSU)
77	20	2	19	2	0	After 'surprises' insert: 'This is reducing vulnerability of and increasing opportunities for people. Central to sustainable development is that it has a human face and that in its ultimate goal improves human well being in terms of health, education and employment as well as all other social aspects. (Harsdorff, Marek, ILO)
78	20	2	19	2	19	Statement starts with "Such responses". Please indicate which response are meant.\n\n (NETHERLANDS)
79	20	2	19	2	19	replace "surprises" with "unforeseen events" (ITALY)

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80	20	2	21	0	0	Adaptation efforts will need to consider the increased intensity, frequency, and duration of extreme events due to future climate change. Adaptation based only on recent experience or extrapolation of historical trends could be largely ineffective. (Backus, George, Sandia National Laboratories)
81	20	2	23	2	23	Statement says "fostering climate". Probably what is meant is: "fostering climate change adaptation and mitigation".\n\n (NETHERLANDS)
82	20	2	24	0	0	Not clear what "This process" refers to. (UNITED STATES OF AMERICA)
83	20	2	25	2	27	Statement is unclear and would benefit from cutting into shorter sentences and rephrasing.\n\n (NETHERLANDS)
84	20	2	29	2	32	The sentence is unclear when discussing sustainable development as the ultimate aim. The references to mitigation and adaptation are clear but the reference to 'elements of sustainable development pathways that contribute to climate-resilience' is not. Is it supposed to be 'other' elements of sustainable development pathways (in addition to to elements of mitigation and adaptation) that lead to sustainable development? (AUSTRALIA)
85	20	2	32	2	32	Define climate-resilience (Sosa-Rodriguez, Fabiola S., University of Waterloo)
86	20	2	35	2	36	"threats to sustainable development.....substantial"-This generalization needs to be further clarified since threats to sustainable development not only depend on the magnitude of climate change impacts, it also related to the coping capacities and knowledge, among other characteristics. (Sosa-Rodriguez, Fabiola S., University of Waterloo)
87	20	2	36	2	37	The statement is too long, repeting in some extent and needs rephrasing. \n\n (NETHERLANDS)
88	20	2	39	2	43	The statement is unclear and would benefit from cutting into shorter sentences and rephrasing.\n\n (NETHERLANDS)
89	20	2	39	2	43	Given this explanation, what type of evidence is available? It would be useful to give a sense of the available (if limited) lines of evidence in general terms. But I would put all of this in the introduction (20.1) rather than the executive summary, per my previous comment. (Mastrandrea, Michael, IPCC WGII TSU)
90	20	2	43	2	43	Insert: "The task of this chapter is, BY NECESSITY, to move out into uncharted territory." (UNITED STATES OF AMERICA)
91	20	2	45	0	47	How is it possible to get high confidence with medium evidence?. Furthermore ch. 18 (WGII) mentions the various difficulties to attribute climate change to changes/drivers in processes in the human system. How is then possible that ch 20 makes statements about development issues with such a high level of confidence? I'm aware that this is one of the biggest challenges for the 5AR, but there is no help stating high levels of confidence on one side and very low on the other parts of the report (Robledo Abad, Carmenza, HELVETAS Swiss Intercooperation)
92	20	2	45	2	45	The opening point on an adaptation chapter should not start with a single angle (here development), rather the point that is made here is relevant to a much broader context (sustainability, conservation, development, etc%Ű_). It would be more useful, and less limiting to start from the broadest perspective possible. (UNITED STATES OF AMERICA)
93	20	2	45	2	46	In the bolded sentence, climate change threat should be related with other threats to SD as already mentioned earlier in line 21 of page 2 (de Campos, Christiano, Petroleo Brasileiro SA)
94	20	2	47	2	48	The causal relationship in the statement is unclear. Because human-induced climate change can no longer be avoided, some impacts are already being observed? Please be clear in what you want to state.\n\n (NETHERLANDS)
95	20	2	47	2	48	This statement (first nonbold sentence) needs refinement and further specificity to support the bold finding. What impacts on development are being observed, and is it those same impacts that are projected to increase or other new impacts on development (or both)? Finally, it is not clear that the use of "virtually certain" is necessary here, as this does not appear to be a quantitative statement. "Projected to increase" may be a better option, depending on the other refinements made. (Mastrandrea, Michael, IPCC WGII TSU)
96	20	2	48	2	48	Line 48 starts with "they". To who (or what) does "they" refer?\n\n (NETHERLANDS)
97	20	2	48	2	48	Statement reads "added to other stresses". Please indicate which other stresses.\n\n (NETHERLANDS)
98	20	2	48	2	51	Statement is very unclear and would benefit from cutting into shorter sentences and rephrasing.\n\n (NETHERLANDS)

#	Ch	From Page	From Line	To Page	To Line	Comment
99	20	2	48	2	51	Statement is too long, with lack of coherence, e.g., - 'related to such objectives as poverty reduction, health and livelihood security' is not properly linked with the earlier and later part of the sentence. Making sentence shorter and rephrasing is necessary.\n\n (NETHERLANDS)
100	20	2	49	2	0	After 'populations' insert: 'households, workers and employers' (Harsdorff, Marek, ILO)
101	20	2	49	2	49	Statement reads "... related to ...". Please indicate what is related to what.\n\n (NETHERLANDS)
102	20	2	50	2	0	After 'reduction' insert: 'employment creation'. (Harsdorff, Marek, ILO)
103	20	2	50	2	50	Line starts with "such objectives". Please indicate to which objectives "such objectives" refer.\n\n (NETHERLANDS)
104	20	2	50	2	50	Line includes "but". But refers to a contrast. Which contrast is meant here?\n\n (NETHERLANDS)
105	20	2	53	2	54	I think it could be helpful to clarify further what is meant by the 2 categories: how they differ and how they relate to adaptation and mitigation. For example, does category a include adaptation and mitigation or just mitigation? Does category b reflect sustainable development? How does transformation fall into these categories? Clarifying these points would make the rest of the paragraph much easier to understand with respect to the bold key finding. (Mach, Katharine, IPCC WGII TSU)
106	20	2	53	3	1	This bold finding needs refinement, as currently the (a) and (b) category descriptions are somewhat confusing. It is not clear whether (a) includes both adaptation and mitigation, and in (b) the scope of "risk management" is unclear given its presentation alongside adaptation. Based on the two bullets presented on page 4, lines 9-11, I assume (a) does refer to both mitigation and adaptation, and that risk management in (b) also refers to both types of actions. I would suggest more closely adopting the wording on page 4 here for clarity. (Mastrandrea, Michael, IPCC WGII TSU)
107	20	2	53	3	4	Move this paragraph to the beginning of the executive summary for clarification. It includes a definition of climate-resilient pathways, which is one of the most relevant concepts discussed throughout the chapter. (Sosa-Rodriguez, Fabiola S., University of Waterloo)
108	20	3	0	0	0	Recent research suggests that mitigation and adaptation are likely to be more effective when they are designed and implemented in the context of other interventions within the broader context of sustainability and resilience. (Chapter 20 page 16 lines 41-50) This is a fundamental message of the IPCC which has been stated since the TAR that needs to be reinforced as there are always newcomers to the climate change field unfamiliar with past reports; and therefore, we strongly suggest that it be included in the ES of the Chapter 20 as a starting point. (JAPAN)
109	20	3	1	3	2	Authors need to clarify in which sense "adaptation and mitigation have the potential to impede sustainable development" and vice versa (ITALY)
110	20	3	1	3	3	Would challenge how this finding is worded in that it seems to overstate the fact that adaptation and mitigation can be equally good or equally bad for sustainable development (similar comments being made in underlying chapter). Therefore suggest softening to include at a minimum "in some cases can" impede sustainable development. (UNITED STATES OF AMERICA)
111	20	3	1	3	4	Some further specifics to illustrate the contributions and impedances described here would be very useful, as currently this description does not provide much insight into what these interactions mean. Sections 20.2.2 and 20.2.3 provide some useful material in this respect. (Mastrandrea, Michael, IPCC WGII TSU)
112	20	3	3	3	3	Statement starts with "Both kinds". What is meant with "both"? Adaption as well as mitigation (line 1)? Or adaptation and mitigation as well as sustainable development strategies and choices (lines 1-2)?\n\n (NETHERLANDS)
113	20	3	3	3	3	Line includes "climate change responses" directly followed by "Both kind of responses". Using of the word "responses" directly after each other in different ways may be confusing.\n\n (NETHERLANDS)
114	20	3	3	3	4	The statement needs rephrasing, e.g., - Both kinds of responses are needed to reduce risks of\n\n (NETHERLANDS)

#	Ch	From Page	From Line	To Page	To Line	Comment
115	20	3	6	0	8	Which "two categories"? In the paragraph before you referred to "actions" as well as to "adaptation" and "mitigation". Do you mean here complementarity between adaptation and mitigation measures? (Robledo Abad, Carmenza, HELVETAS Swiss Intercooperation)
116	20	3	6	3	6	What is meant with "each of the two categories of responses"? \n\n (NETHERLANDS)
117	20	3	6	3	6	What is meant by 'other' here ? Please clarify \n\n (NETHERLANDS)
118	20	3	6	3	6	It would be helpful to clarify what is meant by "each of the 2 categories." Are the 2 categories a and b from the previous paragraph, or are they adaptation and mitigation? If the former, it would be clearest if the reader had a better sense of what responses are relevant to each category, along the lines of my comments on the bold statement of the previous paragraph. Additionally, casual usage of the reserved likelihood term "likely" should be avoided. (Mach, Katharine, IPCC WGII TSU)
119	20	3	6	3	7	Following from the previous paragraph, it is not clear whether the two categories referenced here are (a) and (b) in the previous paragraph, or adaptation and mitigation. Please specify for clarity. In addition, the use of "likely" here appears to be casual, and should be replaced to avoid confusion with the calibrated likelihood term. Likewise, "moderately high confidence" should be either "medium confidence" or "high confidence" as appropriate, and "medium high agreement" should be "medium agreement" or "high agreement." (Mastrandrea, Michael, IPCC WGII TSU)
120	20	3	7	3	7	For the level of confidence and summary term for agreement here, it would be preferable to more directly use the terminology of the uncertainties guidance. (Mach, Katharine, IPCC WGII TSU)
121	20	3	8	3	9	Please avoid circular reasoning. Sentence now reads: pathways that are resilient are likely to be resilient. \n\n (NETHERLANDS)
122	20	3	8	3	10	Statement is unclear and would benefit from cutting into shorter sentences and rephrasing. \n\n (NETHERLANDS)
123	20	3	8	3	11	Again, further specifics would be useful to illustrate these points. What types of challenges and threats are envisioned in the "wide range" mentioned in line 8? What "windows of opportunity" are meant in lines 10-11? In addition, since "risk management" is used in the report generally to refer to risks related to climate change, it might be clearest to rephrase in lines 9-10 to say "...strengthening capacities for management of other risks." (Mastrandrea, Michael, IPCC WGII TSU)
124	20	3	10	3	10	Which goals are meant with "each goal"? Please indicate. \n\n (NETHERLANDS)
125	20	3	10	3	10	Please indicate what is meant with "the other". \n\n (NETHERLANDS)
126	20	3	10	3	10	Please indicate which contrast is meant, when using the word "but". \n\n (NETHERLANDS)
127	20	3	10	3	11	Please indicate which "windows of opportunity" are meant and why these opportunities may narrow over time. \n\n (NETHERLANDS)
128	20	3	13	0	14	Are you sure that the proper term here is "resilient"? Or do the systems need to go beyond resilience and start to adapt? How do you define the difference between increasing resilience and starting adaptation? (adaptation in the sense that the system won't come back to the initial situation, but will be modified -adapted - towards a new situation). The chapter discusses "climate-resilient pathways". Perhaps you are introducing this as a concept for resilience of the development processes and beyond the (current) resilience of the natural and human systems. If that is the case, that should be clarified somewhere. If that is clarified in another chapter, then the corresponding cross-reference is needed (Robledo Abad, Carmenza, HELVETAS Swiss Intercooperation)
129	20	3	13	3	17	Similar statements appear in other chapters, but the phrase "Adaptation to climate" is used instead of "climate resilience". (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
130	20	3	13	3	17	Integrate adaptation to this idea. (Sosa-Rodriguez, Fabiola S., University of Waterloo)

#	Ch	From Page	From Line	To Page	To Line	Comment
131	20	3	13	3	17	It is unclear if mitigation is considered as a part of climate resilient pathways or a parallel approach. (Chatterjee, Monalisa, IPCC WGII TSU)
132	20	3	13	3	23	Recommend the authors attempt to combine these points, as they are somewhat redundant, and condensing the salient points of this chapter help to communicate the findings of this chapter. (UNITED STATES OF AMERICA)
133	20	3	14	3	14	Indicating statement as "high confidence" and "high agreement" is not supported by the underlying material. Medium confidence and medium agreement would be more appropriate. Please also bear in mind that "resilience" is a frame to interpret empirical phenomena. Using "resilience" as a research frame is also still under discussion itself. See e.g. E.g.: Smith, A. and Stirling, A., 2010, The politics of social-ecological resilience and sustainable socio-technical transitions. Ecology & Society, vol. 15, iss. 1, art. 11. \n\n (NETHERLANDS)
134	20	3	20	3	21	Indicating statement as "high confidence" and "high agreement" is not supported by the underlying material. Medium confidence and medium agreement would be more appropriate. \n\n (NETHERLANDS)
135	20	3	21	3	22	In the terminology of the special report on extremes, "climate extremes" was considered synonymous with "extreme weather and climate events," as introduced in the summary for policymakers. The distinction being made here between climate extremes and climate-related extreme weather events is not fully apparent, and wording could be considered. Additionally, it seems there are other non-linear potential changes in climate or in physical systems that are relevant to this statement--should they be mentioned? (Mach, Katharine IPCC WGII TSU)
136	20	3	21	3	23	The statement: "Significantly large and/or rapid increases in climate extremes and climate-related extreme weather events are..." is not quite correct and it should be consistent with conclusions made by WG? (Duan, Juqi, National Climate Center, Chinese Meteorological Administration)
137	20	3	21	3	23	As mentioned in my general comments, here it would be better to use either "climate extremes" or "climate-related extreme weather events," but not both. In addition, a broader set of impacts of climate change may be relevant to this statement, such as those associated with larger magnitudes of climate change. (Mastrandrea, Michael, IPCC WGII TSU)
138	20	3	25	3	25	Not only at a global scale. It is a multi-scale phenomenon. Mitigation and adaptation to climate change, particularly adaptation, can be studied locally in terms of actions implemented to reduce or cope with climate change impacts. (Sosa-Rodriguez, Fabiola S., University of Waterloo)
139	20	3	25	3	31	A conceptual diagram in the relevant section would be very useful. (Chatterjee, Monalisa, IPCC WGII TSU)
140	20	3	25	3	31	Here too, further specificity would be useful. Does the "range of actions" mentioned in line 26 mean actions beyond those related to adaptation and mitigation, or a subset of adaptation and/or mitigation actions? The wording in the bold sentence seems to imply the former, while the first nonbold sentence seems to imply the latter. In addition, the last sentence repeats the point made on page 2 lines 53-54. (Mastrandrea, Michael, IPCC WGII TSU)
141	20	3	26	3	26	It would be clearest to indicate briefly what is meant, more specifically, by "a range of actions." (Mach, Katharine, IPCC WGII TSU)
142	20	3	27	3	27	Please indicate to which scales "those scales" refer.\n\n (NETHERLANDS)
143	20	3	27	3	30	The sentence is ambiguous i.e. the link between limited capacity to include mitigation in climate resilience strategies and contribution to causes of climate change (Dube, Pauline, University of Botswana)
144	20	3	28	3	28	Change "many developing regions" to "some developing countries". There are many developing countries that can make major contributions to mitigation -- for example, China, India, Brazil, Mexico, and Indonesia. (UNITED STATES OF AMERICA)
145	20	3	28	3	30	The degree of contribution to the causes of climate change is not a reason for the capacity to implement mitigation measures. Please revise sentence. (GERMANY)

#	Ch	From Page	From Line	To Page	To Line	Comment
146	20	3	28	3	30	The description, "relatively local scales in many developing regions have limited capacities to include mitigation in their climate-resilient strategies because they contribute very little to the causes in climate change", should be deleted or revised.\nIt has less to do with the text in sections 20.2.3 and 20.6.1. In addition, the recognition of mitigation capacity in developing regions seems to be inadequate. The GHG emission from developing regions, especially in the last decade, was not so small (e.g., in 2010, China and India contributed 24% and 5.4 % of energetic-origin GHG emission in the world, respectively.); and there remains a larger possibility to improve energy efficiency (e.g., power generation efficiency) in developing regions, compared to developed regions. (For the details of the GHG reduction potentials, please refer to Akimoto et al. (2010), Estimates of GHG emission reduction potential by country, sector, and cost, Energy policy, 38, 3384–3393.) (HAYASHI, Ayami, Research Institute of Innovative Technology for the Earth (RITE))
147	20	3	28	3	30	The reason why developing regions have '... limited capacities to include mitigation in their climate resilient starteies because hey contribute very little to the causes of climate change' is not clear. Please rpharse or explain the statemet. \n\n (NETHERLANDS)
148	20	3	28	3	30	The logic here could be clarified. Does the chapter team mean that developing regions can have little capacity to introduce climate mitigation given financial, institutional, and other constraints, or that emissions can be low in such areas and thus cannot be reduced? I assume the latter is meant, and it could be helpful to the reader to be more explicit if so (or if not). (Mach, Katharine, IPCC WGII TSU)
149	20	3	30	3	31	This statement is important, and it would be very helpful to specify further what is meant by "actions" so the reader understands further the conclusion of the author team. (Mach, Katharine, IPCC WGII TSU)
150	20	3	33	3	38	Authors may wish to connect this discussion with long term/ mid term future eras. (Chatterjee, Monalisa, IPCC WGII TSU)
151	20	3	36	3	36	Please indicate what is meant with "co-benefits".\n\n (NETHERLANDS)
152	20	3	41	3	41	It would be preferable to use the term "robust" in place of "strong" given the uncertainties guidance for authors and its defined summary terms for evidence. (Mach, Katharine, IPCC WGII TSU)
153	20	3	41	3	41	Strong evidence should be "robust evidence." (Mastrandrea, Michael, IPCC WGII TSU)
154	20	3	43	3	43	Please indicate what is meant "as a basis".\n\n (NETHERLANDS)
155	20	3	46	0	0	Section 20.1. This section would be most effective if overlap with the executive summary were reduced to a minimum. (Mach, Katharine, IPCC WGII TSU)
156	20	3	46	0	0	Section 20.1: As mentioned in comments on the executive summary, the overlap between this section and the ES should be reduced. That material seems best placed here. (Mastrandrea, Michael, IPCC WGII TSU)
157	20	3	48	3	4	Chapter 18 covers detection and attribution of observed impacts, but not vulnerabilities and prospects for adaptation. (Mastrandrea, Michael, IPCC WGII TSU)
158	20	3	49	3	49	Given that chapter 18 really focuses on impacts, much more than vulnerabilities or adaptation, it would be preferable to cross-reference additional chapters here. (Mach, Katharine, IPCC WGII TSU)
159	20	3	53	0	54	This sentence begins with "In terms of "what to do" to minimize climate change....". Minimazing climate change is mitigation! The idea of the sentence is good, but it needs rewording (Robledo Abad, Carmenza, HELVETAS Swiss Intercooperation)
160	20	3	54	0	0	The phrase “climate resilient pathways” could be replaced by “ pathways for socioeconomic development of society that are resilient to climate change impacts”. (Singh, Anirudh, University of the South Pacific)
161	20	3	54	3	54	Insert: "Climate-resilient pathways are DEFINED HERE AS evolutionary..." (UNITED STATES OF AMERICA)
162	20	4	1	4	1	Perhaps, more than complex systems (in general), it is related to socioecological systems. (Sosa-Rodriguez, Fabiola S., University of Waterloo)
163	20	4	1	4	2	Suggested edit: "SUCH PATHWAYS are BASED ON continuAL, interactive processes of..." (UNITED STATES OF AMERICA)

#	Ch	From Page	From Line	To Page	To Line	Comment
164	20	4	9	4	9	Statement begins with: "Actions to reduce climate change". Probably what is meant is: human-induced climate change.\n\n(NETHERLANDS)
165	20	4	9	4	10	20.1. Elaborate more on why mitigation and adaptation is increasingly being seen and should be seen together since this is a recent development (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
166	20	4	9	4	11	Link both type of actions to sustainable development (how they can contribute to this end) (Sosa-Rodriguez, Fabiola S., University of Waterloo)
167	20	4	10	0	11	What is meant with this second point? Please reword it (Robledo Abad, Carmenza, HELVETAS Swiss Intercooperation)
168	20	4	17	4	19	DELETE BOX 20-1: Definition of climate resilient pathways, as it presumes meaning of this term within the UNFCCC itself, when this exact term is not defined in the UNFCCC (UNITED STATES OF AMERICA)
169	20	4	17	4	47	Adaptation is not included in these examples of international agreements. Nevertheless, it has been recognized in several international conferences as relevant in order to cope with those climate change impacts that cannot be avoided. (Sosa-Rodriguez, Fabiola S., University of Waterloo)
170	20	4	17	4	47	A discussion about how these goals/agreements are translates in terms of climate resilient pathways would be interesting and illustrative. (Sosa-Rodriguez, Fabiola S., University of Waterloo)
171	20	4	21	4	30	20.1. Mention the legally binding nature of the agreement and the ratification status, making it a global consensus (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
172	20	4	21	4	47	Within this text box, the paragraph beginning "Article 2" is the only one that speaks to climate-resilient pathways; the other two paragraphs do not speak to pathways at all and could be deleted. (UNITED STATES OF AMERICA)
173	20	4	23	4	24	The wording here needs a slight revision to clarify that it is the stabilization of greenhouse gases in the atmosphere in a timeframe sufficient to "allow ecosystems..." (Mastrandrea, Michael, IPCC WGII TSU)
174	20	4	24	4	42	Page numbers are absent at quotes.\n\n(NETHERLANDS)
175	20	4	38	4	0	Insert: 'In the preamble the Cancun Agreement highlights the central importance of the link between climate change and employment and 'Realizes that addressing climate change requires a paradigm shift towards building a low-carbon society that offers substantial opportunities and ensures continued high growth and sustainable development, based on innovative technologies and more sustainable production and consumption and lifestyles, while ensuring a just transition of the workforce that creates decent work and quality jobs.' (UNFCCC 2011, Cancun Agreement). (Harsdorff, Marek, ILO)
176	20	4	51	4	51	Does "two categories of responses" refer to the two bullet points on p.4 lines 9-11, or adaptation and mitigation?\n (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
177	20	5	1	5	2	I guess "sectors" describes it better than "areas", which is a very fuzzy term. I do not completely understand the meaning of this sentence, but if you think of cross-sectoral challenges - then call it cross-sectoral challenges; that would be much clearer. (GERMANY)
178	20	5	1	5	2	For this statement, it would be clearest to provide a line-of-sight reference to the chapter section where corresponding assessment is developed. (Mach, Katharine, IPCC WGII TSU)
179	20	5	2	5	2	Suggest inserting "rather than incremental approaches" after "require transformations" and deleting ending phrase " -- beyond incremental approaches"\nOn this same line, one of numerous examples where throwing in the phrase "sustainable development" may not be necessary as it may actually be making the statement less clear to some audiences. Urge authors to state the meaning more precisely rather than relying on this vague term. (UNITED STATES OF AMERICA)

#	Ch	From Page	From Line	To Page	To Line	Comment
180	20	5	4	5	11	This discussion needs to be connected with chapter 14's discussion on response options. (Chatterjee, Monalisa, IPCC WGII TSU)
181	20	5	19	5	25	Suggest defining "transformational adaptation" here. (Bettencourt, Sofia, World Bank)
182	20	5	19	5	25	Suggest authors move this paragraph up because the first time that key terms are defined should not appear on page 5. (UNITED STATES OF AMERICA)
183	20	5	22	5	25	Statement is unclear and would benefit from cutting into shorter sentences and rephrasing. \n\n (NETHERLANDS)
184	20	5	22	5	25	Consider ending sentence after "stress" or ending after "other social goals". The ending phrase, especially the inclusion of "in order themselves to be sustainable" makes this statement difficult to understand. (UNITED STATES OF AMERICA)
185	20	5	22	5	25	Rewrite this circular definition of "sustainable development" that uses the term "sustainable" twice. (UNITED STATES OF AMERICA)
186	20	5	31	5	33	what could be the possible opportunities here ? \n\n (NETHERLANDS)
187	20	5	36	0	0	Secure consistency with Ch.4 WGIII and include corresponding cross-references (Robledo Abad, Carmenza, HELVETAS Swiss Intercooperation)
188	20	5	36	6	54	The link between sustainable development and climate change needs to be further clarified. Perhaps, climate change impacts can be explained in terms of economic activities, life styles or ways of life; concepts use to define sustainable development. (Sosa-Rodriguez, Fabiola S., University of Waterloo)
189	20	5	40	5	40	Replace "Understanding of sustainable development have developed considerably" by "Understanding of sustainable development have been developed considerably" (Sosa-Rodriguez, Fabiola S., University of Waterloo)
190	20	5	54	6	2	The statement '(particularly in industriaized conuntries' is an sufficiently founded generalization, and is lacking evidence and references. \n\n (NETHERLANDS)
191	20	6	8	6	10	I a not sure that just saying "poverty is one of the main causes of environmental degradation" describes the problem in correct terms. it is of course taken from the Brundtland report but it is not all the story. It seems that excessive pressure on natural resources from developed countries (unsustainable consumption life-style if applied to all the world given its carrying capacity) is even more important. Then, of course, least developed countries still have very bad habits (e.g. use of traditional biomass for cooking). I would suggest revising this part in order to avoid misunderstandings in the debate "polluting vs vulnerable countries" (ITALY)
192	20	6	9	6	9	The Brundtland report may have said that at that time but now there is ample evidence pointing to affluence as a major driver of global environmental degradation (Dube, Pauline, University of Botswana)
193	20	6	10	6	11	The citation 'Lafferty and Meadowcroft, 2010' is inaccurate, It will be 'Leaferty and Meadowcroft, 2000' and in the refrence section the publisher will be 'Oxford University Press' not 'Osford University Press'. \n\n (NETHERLANDS)
194	20	6	11	6	12	Explain how sustainable development has been operationalized. It is relevant because it was the first attempt to unify measures to monitor sustainable development advances and obstacles worldwide. (Sosa-Rodriguez, Fabiola S., University of Waterloo)
195	20	6	17	6	17	Provide some examples of those principles (Sosa-Rodriguez, Fabiola S., University of Waterloo)
196	20	6	17	6	18	In the ciation - 'Hopwood, Mellow, and O'Brien, 2005' is inaccurate, 'Mellow' shuld be replaced by 'Mellor' here. \n\n (NETHERLANDS)
197	20	6	22	6	22	The refrence 'Scriciu et al., 2011' is not provided in the refrence, should it be 'Scricio et al., 2013' ? The refrence also needs appopriate year, volume and page number in it. \n\n (NETHERLANDS)
198	20	6	23	6	23	equate equity. Rewording (ITALY)
199	20	6	28	6	34	Explain how climate change impacts can threaten sustainable development and how development can increase climate change impacts and vulnerability (Sosa-Rodriguez, Fabiola S., University of Waterloo)

#	Ch	From Page	From Line	To Page	To Line	Comment
200	20	6	36	6	40	20.2.1.1. What is "not wasteful"? Very vague, make transparent which ontological models are underlying these different development concepts, since there is no objectivity in these concepts (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
201	20	6	36	6	40	Please consider reflecting this finding also in the TS and possibly in SPM. (NORWAY)
202	20	6	36	6	40	Define climate-resilient development (Sosa-Rodriguez, Fabiola S., University of Waterloo)
203	20	6	41	6	0	Insert: 'While development is driven by people the entry point for sustainable development is people as well. The World Development Report 2013 states that 'development happens through jobs' and 'economies grow as people get better at what they do'. Translating the conventional development approach to sustainable development, sustainable development starts with putting people first. This is to capacitate people to get better in doing things sustainably while creating jobs for sustainable development. Increasing evidence suggests that positive employment effects result from adaptation and mitigation policies and that a practical pathway to sustainable development includes labor market, education and skills policies and social dialogue (ILO 2012, Working towards sustainable development). (Harsdorff, Marek, ILO)
204	20	6	42	6	49	20.2.1.1. Weak formulation, acknowledge the debate around rights to development (as formulated in Art 2 of the convention) and need to halt CC and lack of consensus on what is justifiable pattern of consumption. Mention suppressed demand debate in the electricity sector. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
205	20	6	42	6	49	This paragraph only gives obvious basic statements, thus it can be deleted completely. (GERMANY)
206	20	6	45	6	46	The example provided in the statement is not strongly founded. Is not that because of 'limited capacity' rather than what is stated here? \n\n (NETHERLANDS)
207	20	6	47	6	49	The message in the line is not consistent with the previous lines and example, please rephrase the statement in accordance to the previous sentences. \n\n (NETHERLANDS)
208	20	6	47	6	49	Please consider reflecting this finding also in the TS and possibly in SPM. (NORWAY)
209	20	6	48	0	0	missing word- "with" after "consistent" (WOODS, Paul, World Vision)
210	20	6	48	6	48	with left out after "consistent" (UNITED STATES OF AMERICA)
211	20	6	48	6	48	Is climate resilient development different from sustainable development, if yes it has to be explained somewhere in the beginning of the chapter. (Chatterjee, Monalisa, IPCC WGII TSU)
212	20	6	49	6	49	As I pointed out in the previous draft of this chapter, Gilbert (2006) is not a correct reference here; he says nothing about sustainable development or climate change. His work may be used in the next paragraph as indicating that happiness is not necessarily related to material consumption. (Böhm, Gisela, University of Bergen)
213	20	6	51	0	0	Discussion on resource efficiency should be provided. (Constantinos Cartalis, Environmental Physics, University of Athens, Greece) (GREECE)
214	20	6	51	6	51	Suggest deleting sentence beginning with "There is a growing debate..." This seems highly unnecessary. (UNITED STATES OF AMERICA)
215	20	6	51	7	6	This paragraph mentions the discussion of lifestyles and how to measure development. I do not see this as necessary for this chapter, but if you really decide to discuss it, then do it properly and not only in one short paragraph. (GERMANY)
216	20	7	2	7	4	The statement is unclear, please provide example of 'how it is greatly beneficial'. \n\n (NETHERLANDS)

#	Ch	From Page	From Line	To Page	To Line	Comment
217	20	7	9	7	38	While concept one (climate change may derail current sustainable development policy and potentially offset already achieve gains) is a great point, it is not explained well. Climate change has the ability to affect many environmental protection regulations, development regulations, and a host of other best practices that protect public health, economies and the environment. However it is only dealt here in the vaguest of terms. Given the importance of this vulnerability set, and the potential to for adaptation action in these areas, it would behoove the IPCC to make this section a bit more tangible so readers get some idea of what is at risk and what could be done about it. Box 20-2 does little to fill this void. (UNITED STATES OF AMERICA)
218	20	7	11	7	16	Explain the 4 representative pathways mentioned in the paragraph. Discuss which pathway support more effective mitigation, adaptation and sustainable development (Sosa-Rodriguez, Fabiola S., University of Waterloo)
219	20	7	11	7	38	For this paragraph, it would be preferable to provide further citations to the primary literature. Also, more specific references to the relevant chapter sections of chapters cited would be preferable where appropriate. (Mach, Katharine, IPCC WGII TSU)
220	20	7	12	7	16	Mention sustainable development threats explained by climate change impacts, and how they are related to sustainable development pathways (Sosa-Rodriguez, Fabiola S., University of Waterloo)
221	20	7	15	7	16	See also my comments at pag. 3, rows 1-2. As in the previous IPCC IV AR, authors report that climate change and sustainable development can result in both synergies and trade-offs. However, in the list authors present a number of examples. It seems that the only (and very specific to local conditions) trade-off between climate change policy and sustainable development is at rows 17-18. Then, a list of potential win-win outcomes follow. I would re-organize rows 11-38 saying: "even though climate change may at some extent affects negatively sustainable development - e.g. (or what the authors refer about the trade off between climate and development policy at pag. 8, rows 29-33, since for very early stage of development, sustainable development and development can be meant as the same, or again pag. 9, rows 29-31 on intergenerational equity) -, generally speaking there is a positive correlation": this would be more consistent with the list that follows in the text (rows 18-30) (ITALY)
222	20	7	18	7	20	It might be more relevant to give reference to more recent literature than IPCC 2007 here, such as the IPCC SREX Report 2012 which states that "the interactions among climate change mitigation, adaptation, and disaster risk management may have a major influence on resilient and sustainable pathways (high agreement, limited evidence)" (quoted from page 20, IPCC 2012). (Yuzva, Kristina, United Nations University Institute for Environment and Human Security (UNU-EHS))
223	20	7	18	28	29	20.2.1.1. Mitigation responses which are not designed along the capabilities and needs of host regions also have the potential to lead to unsustainable development. Strong safeguards are needed here, mention safeguard development in forest carbon sector (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
224	20	7	25	7	29	This lengthy statement is problematic and encourage the authors to state this more clearly. The meaning of "no-regrets interventions" is unclear. The example of "increased adaptive capacity" is part of sustainable development is confusing in this context. (UNITED STATES OF AMERICA)
225	20	7	26	7	26	Please indicate what are 'no-regrets interventions' ?\n\n (NETHERLANDS)
226	20	7	26	7	26	Need to define "no regrets interventions". However, these are the easiest cases. (UNITED STATES OF AMERICA)
227	20	7	26	7	27	Please consider adding "functioning ecosystems and maintained biodiversity " in the list within brackets. (NORWAY)
228	20	7	30	7	30	Include the opportunities that climate changes has brought to promote more sustainable development pathways (Sosa-Rodriguez, Fabiola S., University of Waterloo)
229	20	7	34	7	34	Development policy also reduces vulnerability to climatic and non-climatic stressors. (Sosa-Rodriguez, Fabiola S., University of Waterloo)

#	Ch	From Page	From Line	To Page	To Line	Comment
230	20	7	34	7	35	The meaning of positive and negative feedbacks here in this context is not at all clear. Suggest either deleting or state in next sentence that this concept specifically will be clarified (if it is). (UNITED STATES OF AMERICA)
231	20	7	34	7	35	Provide an example (Sosa-Rodriguez, Fabiola S., University of Waterloo)
232	20	7	40	0	0	Box 20-2: Are the items presented in this box intended to reflect the reasons for concern presented in Chapter 19? This is currently unclear. I would recommend more clearly introducing the five reasons for concern discussed in Chapter 19 and how the subjects presented in this box relate to those categories. Some appear to relate to the first reason for concern (unique and threatened systems), one is the title of the second reason for concern (extreme events), and others relate to aggregate impacts and the distribution of impacts. Please also explain the rationale for the selection of the items in the bullet list. The final sentence of the box (page 8 lines 1-2) also needs further elaboration or deletion. How do these cross-cutting concerns relate to effects on sustainable development? (Mastrandrea, Michael, IPCC WGII TSU)
233	20	7	42	0	0	Box 20-2. It is not clear if these "reasons for concern" follow the same reasons for concern framework used in chapter 19. If direct reference to the chapter 19 categories of reasons for concern is intended, it would be preferable to make the linkages much clearer. If a different approach to reasons for concern is intended, it would be clearest to use a different phrase. (Mach, Katharine, IPCC WGII TSU)
234	20	7	44	7	52	It would be preferable to provide specific cross-references to the relevant sections of chapter 19 for these statements. Additionally, the criteria by which "major concerns about effects on sustainable development" were determined should be clarified. (Mach, Katharine, IPCC WGII TSU)
235	20	7	47	7	47	human systems is a very broad term, please indicate what you mean here.\n\n (NETHERLANDS)
236	20	7	52	7	52	Consider adding "ecosystem function/services" in this point to generate " Losses of endangered species, biodiversity and ecosystem function/services". (NORWAY)
237	20	7	53	0	0	Add additional bullet "Land use/land cover changes" (Constantinos Cartalis, Environmental Physics, University of Athens, Greece) (GREECE)
238	20	8	1	8	2	Much more specific summary of the chapter 19 assessment should be provided here, with specific reference to relevant subsections of that chapter. (Mach, Katharine, IPCC WGII TSU)
239	20	8	11	8	25	I may expect box like this (20-3) many times all over the V IPCC AR. I would check for this avoiding many replications of the same issue. Moreover, if authors want to leave the box in the chapter, it should be put closer to the Figure 20-3. (ITALY)
240	20	8	12	8	12	In place of the word "rich," it could be most effective to indicate more specifically the attributes that made them "rich." (Mach, Katharine, IPCC WGII TSU)
241	20	8	18	8	25	Could the SSPs and RCPs be incompatible? Ideally the SSPs would partly drive the RCPs. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
242	20	8	29	0	0	This section can be condensed further to avoid repetition. (Chatterjee, Monalisa, IPCC WGII TSU)
243	20	8	29	8	37	Include the corresponding reference to IPCC FAR, 2007 (Robledo Abad, Carmenza, HELVETAS Swiss Intercooperation)
244	20	8	37	8	37	Insert text als follows: "... Allouche 2011. However, Michaelowa and Michaelowa (2007) caution against the assumption that spending official development assistance on climate change mitigation will automatically contribute to reaching the Millennium Development Goals." Full reference: Michaelowa, A.; Michaelowa, K. (2007): Climate or development: is ODA diverted from its original purpose?, in: Climatic Change. 84. 1. p. 5-22 (Michaelowa, Axel. University of Zurich)
245	20	8	41	8	42	20.2.1.2. How do sustainable and equitable development pathways look like? (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)

#	Ch	From Page	From Line	To Page	To Line	Comment
246	20	8	42	8	42	To the claim "Moreover, promoting development pathways that are both equitable and sustainable is also key to addressing climate change (Wilbanks, 2003; Nelson et al, 2007; ILO 2011, 2013) Actual documents that could be referenced: (M. Harsdorff, M. Lieuw-Kie Song; K. Philip; M. Tsukamoto. Towards an ILO approach to Climate Change Adaptation, ILO Employment Working Paper No. 104 - Geneva, International Labour Organization, 2011) and (Report V: Sustainable development, decent work and green jobs, International Labour Conference, 102nd Session, 2013) (Harsdorff, Marek, ILO)
247	20	8	42	8	44	Statement is unclear, please rephrase.\n\n (NETHERLANDS)
248	20	8	42	8	45	Is there no new findings since 2001? Take a look to i.a. the IPCC SREX (2012) (Robledo Abad, Carmenza, HELVETAS Swiss Intercooperation)
249	20	8	43	8	44	the debate on climate change has tended to run separately from the wider sustainability discourse - the references are from 1998 and 2001 and thus much too old for this statement, which has changed considerably during recent years. (GERMANY)
250	20	8	47	8	47	Please be specific, use either 'countries' or 'regions', you used 'regions' in later part of the paragraph.\n\n (NETHERLANDS)
251	20	8	47	8	52	Add ILO reference and revise to "Especially in less developed countries / regions, the relationship between vulnerability to climate impacts and development is often inclusive and mutually dependent as such realities as low per capita income and inequitable distribution of resources; rising unemployment, lack of education, health care, and safety; weak institutions , unequal power relations and weak democracy fundamentally shape sensitivity, exposure and adaptive capacity to climate impact - along with other factors influencing risks (Garg et al., 2009; McSweeney and Coomes, 2011; Adger et al., 2003; ILO 2011, 2013) (Harsdorff, Marek, ILO)
252	20	8	47	8	52	The statement is too long. Please cut it into multiple sentences, also specify what do you mean by 'other factors influencing risks'. \n\n (NETHERLANDS)
253	20	9	3	9	4	Did not mention risk insurance as important risk management strategy to increase resilience (see IPCC SREX 2012, p. 10 and 11; along with: Warner, K.; Kreft, S.; Zissener, M. et al. (2012): Insurance Solutions in the Context of Climate Change-Related Loss and Damage. Policy Brief Series No. 6. United Nations University Institute for Environment and Human Security (UNU-EHS). Bonn). (Yuzva, Kristina, United Nations University Institute for Environment and Human Security (UNU-EHS))
254	20	9	3	9	4	Please indicate how 'alert systems' and 'climate forecast' are different ?\n\n (NETHERLANDS)
255	20	9	4	9	7	Finding is applicable everywhere and not just in developed region. (Chatterjee, Monalisa, IPCC WGII TSU)
256	20	9	9	9	11	The statement is not clear, 'however' is probably not necessary in the sentence.\n\n (NETHERLANDS)
257	20	9	9	9	27	The reference: Lahsen M. Sanchez-Rodriguez R., Lankao P.R et al., 2010, Impacts, adaptation and vulnerability to global environmental change: challenges and pathways for an action-oriented research agenda for middle-income and low-income countries. Current Opinion in Environmental Sustainability 2010, 2:364–374 - will be useful to support the case for developing countries. It can also help support some of the discussion in page 11 starting from line 18. (Dube, Pauline, University of Botswana)
258	20	9	9	9	27	In “Sosa-Rodriguez, F.S. (2013). From federal to city mitigation and adaptation: climate change policy in Mexico City. Mitig Adapt Strateg Glob Change. DOI 10.1007/s11027-013-9455-1” there are several examples of actions implemented to reduce vulnerability and enhance mitigation and adaptation by sector in Mexico and Mexico City. It also analyzed the advances and obstacles (socio-technical, behavioral and structural) of these actions/strategies. (Sosa-Rodriguez, Fabiola S., University of Waterloo)

#	Ch	From Page	From Line	To Page	To Line	Comment
259	20	9	9	9	27	This paragraph could reference assessment findings and/or relevant sections of Chapter 13. (Mach, Katharine, IPCC WGII TSU)
260	20	9	12	0	0	ecological citizenship needs to be defined. (UNITED STATES OF AMERICA)
261	20	9	12	9	12	What is meant by 'self-efficacy' and 'ecological citizenship' ? Please elaborate.\n\n (NETHERLANDS)
262	20	9	15	9	17	Unclear: Citizen compliance comes from alienation? And what is the relation to resilience? Citizens comply with the centralized power but this does not lead to resilience? Double-check the argument, or explain better. (UNITED STATES OF AMERICA)
263	20	9	17	9	17	Please revise the reference 'Pelling and Navarrete, 2011' by 'Pelling and Manuel-Navarrete, 2011', also in reference section revise 'Naverrette' by 'Navarrete'\n\n (NETHERLANDS)
264	20	9	20	9	22	Women are not only the most vulnerable but they are also instrumental in adaptation to climate change. Still, they have only a limited role in decision making. (Gupta, Himangana, Panjab University, Chandigarh, India)
265	20	9	20	9	36	Chapter 13 should be cross refered here. (Chatterjee, Monalisa, IPCC WGII TSU)
266	20	9	23	9	27	It might be useful to draw perhaps from regional chapters an e.g. of indigenous, remote communities (Dube, Pauline, University of Botswana)
267	20	9	24	9	27	Important take away point, perhaps make it more visible? (Chatterjee, Monalisa, IPCC WGII TSU)
268	20	9	29	0	33	I would question if this adaptive measures or not. It seems that we have omitted here the concept of maladaptation. In evolutionary ecology, this leads to extinction. (Vasseur, Liette, Brock University)
269	20	9	30	9	30	Please revise the sentence.\n\n (NETHERLANDS)
270	20	9	31	9	32	It is not advisable to subsume 'geoengineering' under 'mitigation'. Please reformulate by drawing a clear distinction between them (consistency within WGII AR 5: A clear distinction has already been drawn in chapter 19, pg. 30, lines 5-11) or by focusing solely on geoengineering. (GERMANY)
271	20	9	31	9	32	some mitigation measures -- Geoengineering is a *fundamentally* different approach to what is usually classified as mitigation, and should not be put under the mitigation family. The main difference is that geoengineering is an emergency response designed to act quickly. One definiton of the response types is that geoengineering addresses past emissions, while mitigation addresses future emissions. The sentence could start out then as, "A third class of risk and damage reduction policy responses, apart from mitigation and adaptation, is geoengineering..." Also see Box 20-6 where the same point should be made, that geoengineering is a third way. (UNITED STATES OF AMERICA)
272	20	9	31	9	34	"Geoengineering" cannot be considered as mitigation measures (all the more adaptation measures). Compare this phrase (page 9, lines 31-34) with that on page 14, line 4. See also Box 20-6. Besides, maybe it is better to use "climate system" instead of "weather system". (Rvaboshapko, Alexey, Institute of Global Climate and Ecology)
273	20	9	31	9	34	A warning about possible adverse effects related to geoengineering and its uncertain impact on sustainable development. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
274	20	9	31	9	34	Explain why or provide examples of how large-scale mitigation causes problems for others. (UNITED STATES OF AMERICA)
275	20	9	32	9	32	Plase explain what do you mean by 'composition of the atmosphere' here, also explain 'large-scale weather sytems'. \n\n (NETHERLANDS)
276	20	9	32	9	32	Choosing geoengineering as the first example that this chapter throws out as an example of a mitigation strategy that could be inconsistent with sustainable development is not very useful. Strongly suggest the authors use a more commonly practiced and understood example. (UNITED STATES OF AMERICA)

#	Ch	From Page	From Line	To Page	To Line	Comment
277	20	9	35	9	36	Plase explain how irrigation may have 'negative effects on other users', also what do you mean by 'other' here ?\n\n (NETHERLANDS)
278	20	9	36	9	38	The statement is not clear, consider rephrasing the sentence.\n\n (NETHERLANDS)
279	20	9	38	9	38	Suggest replacing phrase "unless they are linked to...sustainable development" with "unless there is awareness of, and responses to, these interactions." This is another example where throwing in the term sust. dev. obfuscates a more clear message that could be conveyed by the authors. (UNITED STATES OF AMERICA)
280	20	9	52	9	52	Should this be specified as "economic development"? (CANADA)
281	20	9	52	9	53	Please rephrase the sentence.\n\n (NETHERLANDS)
282	20	9	52	10	28	There are opportunities for mitigation and adaptation to work hand in hand but it's not certain the examples presented in this section are the best. By relying on biocarbon for fossil carbon offsets, there is a risk of creating even greater climate hurdles to be adapted to. Look for some examples of mitigation that reduced fossil based greenhouse gas emissions for local adaptation benefit. For example, stopping mining of coal that pollutes local waterways can enhance the ability of those waterways to continue to support life and clean water by reducing a non-climate stress so the system is only dealing with thermal stresses and water chemistry changes, not pollution as well. Similarly, replacing fossil fuel combustion energy that emits smog causing pollution with renewable energy that does not degrade air quality as increasing temperatures exacerbate smog formation. Those are win-win for the long term. Reading examples like Lines 12-17 does not make clear what tangible activities they might include, but also the statemnet that there is a triple win is not convincing, other than for the very short term. (UNITED STATES OF AMERICA)
283	20	10	1	10	3	There are examples of the obstacles faced by CDM users in Mexico in “Sosa-Rodriguez, F.S. (2013). From federal to city mitigation and adaptation: climate change policy in Mexico City” (Sosa-Rodriguez, Fabiola S., University of Waterloo)
284	20	10	1	10	28	Chapter 13 should be cross refered here. (Chatterjee, Monalisa, IPCC WGII TSU)
285	20	10	3	10	3	Please use 'REDD+' instead of 'REDD'. \n\n (NETHERLANDS)
286	20	10	7	0	0	In fact, the cocnept of ecosystem based adaptation should also be covered here. (Vasseur, Liette, Brock University)
287	20	10	11	10	17	Add, "An example of an innovative project in Indonesia under the REDD+ is the Green Livelihood Access for Central Kalimantan's Inclusive Environmental Response to Climate Change (GLACIER), which aims to improve access to sustainable livelihoods in lcoal communities and to increase biodiversity levels so that the long-term productivity of the forest and peatland is maintained and enhanced for provision of eco-system services. This project is bringing to gether the different aspects of mitigation, adaptation and sustainable development into one." See, http://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/---ilo-jakarta/documents/projectdocumentation/wcms_203333.pdf (Harsdorff, Marek, ILO)
288	20	10	11	10	23	Rather than being "tripple win" approach many CDM projects, especially afforestation/reforestation projects, are only a "single win" mechanism for the private operator. Private companies tend to get a fertile land declared as "severly degraded", remove the existing forest cover or vegetation, and grow economically important trees some of which can cause severe damage to the nearby ecosystem. In a case study that I am conducting for my Ph. D. thesis, a private company has got a land next to a wildlife sanctuary enriched by a major river in the Andhra Pradesh state of India declared as "severly degraded" and enticed the poor tribals to grow eucalyptus. (Gupta, Himangana, Panjab University, Chandigarh, India)
289	20	10	14	10	16	Current statement implies CDM and JI always lead to these triple wins. Provide specifics first, then say such efforts are attempted under CDM and JI. Information that follows this statement also supports this recommended edit. (UNITED STATES OF AMERICA)
290	20	10	17	10	24	Delete, as the same issue is covered in Ch. 13 (p. 16), and Ch. 13 of WG III. (Michaelowa, Axel, University of Zurich)

#	Ch	From Page	From Line	To Page	To Line	Comment
291	20	10	19	10	28	20.2.1.2. Address efforts to reward those mitigation projects which realize sustainable development goals such as through the gold standard and the safeguard debate as well as the EU decision to phase out CERs from non LDCs (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
292	20	10	20	10	21	I suggest using different descriptors here, as these do not appear to be formal uses of "likely." (Mastrandrea, Michael, IPCC WGII TSU)
293	20	10	22	10	23	Please replace 'carbon emissions certificates' by 'certified emission reductions' \n\n (NETHERLANDS)
294	20	10	27	10	28	The reference is too old to support such a statement with relatively new perspectives. Please use latest references.\n\n (NETHERLANDS)
295	20	10	30	11	16	Box 20-4: Please clarify how climate change impacts were attributed in these studies and if other confounding factors (e.g. population growth) were considered when attribution to climate impacts were defined (Robledo Abad, Carmenza, HELVETAS Swiss Intercooperation)
296	20	10	32	0	0	These sorts of examples are very useful to readers. Suggest more of this throughout the chapter. (UNITED STATES OF AMERICA)
297	20	10	34	11	54	For case studies on page 10, only China is mentioned. This part seems very limited at the moment and for a more regional overview please see: UNFCCC.2012. Approaches to address loss and damage associated with climate change impacts in developing countries that are particularly vulnerable to the adverse effects of climate change to enhance adaptive capacity. FCCC/SBI/2012/INF.14. (Yuzva, Kristina, United Nations University Institute for Environment and Human Security (UNU-EHS))
298	20	10	36	10	48	Too much detail is provided here. Please pare down. (UNITED STATES OF AMERICA)
299	20	10	41	10	41	Please elaborate 'Gm3'\n\n (NETHERLANDS)
300	20	10	43	10	43	Please elaborate the unit 'Mhm2'\n\n (NETHERLANDS)
301	20	10	49	10	50	Please note that there are 2 Table 20-1 provided in the chapter, please revise the Table numbers.\n\n (NETHERLANDS)
302	20	10	50	10	50	Table 20-1: The standards of the comparisons for "water and energy saving and CO2 emission reduction" should be mentioned. (HAYASHI, Ayami, Research Institute of Innovative Technology for the Earth (RITE))
303	20	10	53	10	54	The sentence "Sustaining environmental conditions in the region is of vital importance not only for Tibet but also for China as a whole." would create confusion. It is suggested to change "not only for Tibet but also for China as a whole" to "not only for Tibet but also for other regions of China". (CHINA)
304	20	11	2	11	4	Please revise the sentence. Rephrasing is necessary.\n\n (NETHERLANDS)
305	20	11	4	11	7	Please use any peer-reviewed scientific reference here, if possible.\n\n (NETHERLANDS)
306	20	11	7	11	12	Please indicate - what do you mean by grassland yield ? Also please clarify what do you mean by plant species, 'number of species' or 'diversity of species' ? Also, what do you mean by ecosystem services, it a quite broad term ?\n\n (NETHERLANDS)
307	20	11	18	0	0	factors influencing mainstreaming of climate change should in the key findings. (Chatterjee, Monalisa, IPCC WGII TSU)
308	20	11	18	11	19	It is not clear what the other option(s) are, as the paragraph seems to talk mostly about mainstreaming. Also, while the paragraph discusses the many constraints affecting mainstreaming, it does not offer an analysis of the alternative (stand alone climate policy strategies or plans) which by themselves have had very little impact (as they are not tied to budgets). (Bettencourt, Sofia, World Bank)
309	20	11	18	11	26	It would be useful to provide examples of these processes. (Sosa-Rodriguez, Fabiola S., University of Waterloo)
310	20	11	19	11	19	Include references (Sosa-Rodriguez, Fabiola S., University of Waterloo)

#	Ch	From Page	From Line	To Page	To Line	Comment
311	20	11	19	11	21	The chapter could benefit by including discussion of the concept that good development in a world impacted by climate change will require good environmental protection so that resilience can be harnessed from natural systems, which are much cheaper to garner benefit from than engineered solutions which have costs in perpetuity. (UNITED STATES OF AMERICA)
312	20	11	20	11	20	Suggest expanding on the concept of prevalent development interventions. (CANADA)
313	20	11	21	11	24	Please provide references to support this statement. \n\n (NETHERLANDS)
314	20	11	25	11	25	Include references (Sosa-Rodriguez, Fabiola S., University of Waterloo)
315	20	11	27	11	28	Clarify the meaning of "discrepancies between immediate development goals and future CC scenarios": socioecon factors? Impacts? Identified vulnerabilities? (UNITED STATES OF AMERICA)
316	20	11	29	11	29	Unclear what or who "They" refer to. (UNITED STATES OF AMERICA)
317	20	11	29	11	32	The 2005 reference referring to some earlier period may be obsolete. The text should be updated to reflect agreements made by major donors in the Paris Declaration on Aid Effectiveness, Accra Agenda for Action, and Busan Partnership to coordinate priorities with partner governments and other donors. Additionally, paragraphs like this would strongly benefit from a critical assessment on the part of the authors. (UNITED STATES OF AMERICA)
318	20	11	31	11	31	Suggest "climate change considerations" instead of "climate change policy" (UNITED STATES OF AMERICA)
319	20	11	34	11	39	Other obstacles identify by Sosa-Rodriguez (2013) include "lack of understanding of the strategies' objectives, process and outcomes by governmental agencies and inhabitants, as well as a lack of participation and public awareness about climate change. These problems have resulted in poor coordination and collaboration among these participants to address climate change impacts. Indeed, various levels of government have refused to allocate resources to reducing sectoral and local vulnerability. Furthermore, illegality and corruption stand in the way of developing the city's M&A capacity." (Sosa-Rodriguez, Fabiola S., University of Waterloo)
320	20	11	36	11	40	As an addition to these barriers, the lack of institutional memory has significantly hampered governmental processes for the approval of documents in Mozambique (Sietz et al. 2011). It took several years, for example for the Initial National Communication, the National Adaptation Programme of Action (NAPA) and the National Capacity Self Assessment to be submitted to the UNFCCC. This delay was particularly disadvantageous since the NAPA identified urgent adaptation needs which could not be addressed immediately even though resources for implementation were available under the UNFCCC Least Developed Countries Fund. Reference: Sietz, D., Boschütz, M. and Klein, R.J.T. (2011) Mainstreaming climate adaptation into development assistance: rationale, institutional barriers and opportunities in Mozambique. Environ. Sci. Policy 14(4): 493-502. (sietz, diana, Wageningen University)
321	20	11	41	11	41	Unclear whether negatively affect the incidence of malaria means reducing or increasing malaria rates. (UNITED STATES OF AMERICA)
322	20	11	52	12	2	Climate-oriented Units or Secretariats have also been constituted strategically in Zambia (a multi-sectoral Secretariat under the Ministry of Finance), Madagascar (a DRM Policy Unit under the Prime Minister's Office) and Kiribati (under the Office of the President). See, for example, the institutional arrangements under the Zambia Strengthening Climate Resilient (PPCR Phase II) Project, downloadable at http://documents.worldbank.org/curated/en/2013/04/17615484/zambia-second-phase-strengthening-climate-resilience-project (Bettencourt, Sofia, World Bank)
323	20	11	53	11	53	The examples of India and Pakistan can also be given where the Premiers of these countries are directly looking after the climate change related concerns in their respective countries (In Pakistan a Prime Minister's Committee on Climate Change called as PMCCC is working since 2005) (Goheer, Arif, Global Change Impact Studies Centre (GCISC))

#	Ch	From Page	From Line	To Page	To Line	Comment
324	20	12	19	12	19	You have used 'GHG' instead of 'greenhouse gases' earlier, please be consistent, use either GHG or greenhouse gases throughout the chapter. (NETHERLANDS)
325	20	12	24	12	27	Authors should consider using this language, instead of some of the existing language, in exec summary of chapter. (UNITED STATES OF AMERICA)
326	20	12	24	12	34	Clarify if climate-resilient pathways would require different actions, processes and changes depending on the characteristic of the systems. For example, if systems anticipate or react; if their responses are voluntary or not; and/or if systems' responses are planned or spontaneous (Sosa-Rodriguez, Fabiola S., University of Waterloo)
327	20	12	27	12	29	Please consider reflecting this finding also in the TS and possibly in SPM. (NORWAY)
328	20	12	31	12	33	Beyond transformational adaptation, is transformation more broadly relevant here? (Mach, Katharine, IPCC WGII TSU)
329	20	12	32	12	33	Consider omitting last phrase "in order to maintain the potential for sust. dev." The statement appears more clear without it. (UNITED STATES OF AMERICA)
330	20	12	36	12	38	Authors may wish to connect this discussion with long term/ mid term future eras. (Chatterjee, Monalisa, IPCC WGII TSU)
331	20	12	36	12	40	The framing of risks within the eras of climate responsibility and climate options is relevant here. The chapter team might consider my overall comment on "characterization of future risks." (Mach, Katharine, IPCC WGII TSU)
332	20	12	41	0	0	Insert: 'People are not only the victims of negative impacts of climate change; they are the drivers of climate change and the essential agents for redirecting development trajectories. Accordingly pathways can be understood as being choices of people. This understanding – of the central role of people, social dimensions and institutions – should profoundly reshape the way in which policy-makers craft and implement climate change policy. It is especially compelling at this important juncture when many nations are committing to more robust mitigation and adaptation strategies, and the international community is deliberating core elements of the next climate change paradigm amid pressing expectations for concrete results. At its most basic, climate change impacts people and response measures depend on people to be successful. Thus the social dimensions of climate change, the interplay between climate as a phenomenon, its related policy, and society – including the role of people as victims to and agents of climate change – are critical to successful climate policy. To date, however, the human variable of the climate equation has been too frequently missing or weak. The impacts of climate change will increasingly affect the daily lives of people everywhere in terms of employment and livelihoods, health, housing, water, food security and nutrition, and the realization of gender equality and other human rights. Impacts are expected to hit those living in poverty the hardest, partly due to their more prevalent dependency on the very natural resources affected by climate change and also because they have less capacity to protect themselves, adapt or recuperate losses. Effective policies and measures to address these impacts and to reduce greenhouse gas emissions will in large part depend on these same people, and thus largely depend on the transformation of social and economic relations that contribute to their vulnerability.' (Harsdorff, Marek, ILO)
333	20	12	45	12	45	What is meant by "current path toward relatively significant impacts" could be clarified: what is the timeframe meant broadly (near term versus long term), is locked in climate change over the next few decades being referred to, what about the relevance of choices in determining the level of climate change in the 2nd half of the 21st century? (Mach, Katharine, IPCC WGII TSU)
334	20	12	45	12	47	This introductory sentence can be read to imply that significant impacts from climate change are inevitable. It would be useful to provide a clearer sense that there is a timeframe over which impacts are largely a result of past emissions and inertias in climate and socioeconomic systems (and thus impacts can mainly be reduced through adaptation in the shorter-term) and a longer-term timeframe over which impacts are largely a result of the decisions we make now and going forward (in which impacts can be reduced through mitigation starting in the shorter-term and adaptation in the longer-term). (Mastrandrea, Michael, IPCC WGII TSU)

#	Ch	From Page	From Line	To Page	To Line	Comment
335	20	12	48	12	51	It will be useful if it is explained how these two overarching attributes relate to sustainable development. (Chatterjee, Monalisa, IPCC WGII TSU)
336	20	12	53	12	53	Casual usage of "likely" should be avoided as it is a reserved likelihood term. (Mach, Katharine, IPCC WGII TSU)
337	20	12	53	12	53	I suggest using a different descriptor here, as this does not appear to be a formal use of "likely." (Mastrandrea, Michael, IPCC WGII TSU)
338	20	13	1	13	2	Please explain what is meant by 'innovation' and 'development' here.\n\n (NETHERLANDS)
339	20	13	2	13	3	Clarify if it is more adapted and less vulnerable to both climatic and non-climatic stressors. (Sosa-Rodriguez, Fabiola S., University of Waterloo)
340	20	13	4	13	4	What is meant by "randomness" could be clarified, also recognizing that both variability in the climate system and uncertainties/ambiguities about the climate system and sectors impacted are potentially relevant here. (Mach, Katharine, IPCC WGII TSU)
341	20	13	4	13	4	Variability might be a better word than "randomness" here. (Mastrandrea, Michael, IPCC WGII TSU)
342	20	13	9	13	12	The statement is not clear, please rephrase the sentence.\n\n (NETHERLANDS)
343	20	13	14	0	0	Box 20-5: It is not clear whether these elements of climate-resilient pathways are taken from a specific reference or references, or are being presented by the author team in this form as part of their assessment. Please clarify the source of this information. (Mastrandrea, Michael, IPCC WGII TSU)
344	20	13	16	0	0	Box 20-5 some description on how climate resilient pathways integrates with sustainable development would be useful in the beginning of this box. (Chatterjee, Monalisa, IPCC WGII TSU)
345	20	13	16	0	0	Box 20-5. The nature of the material in this box could be clarified. Are these elements being asserted by the chapter? If so, this should be clarified. Alternatively, do they draw directly from the literature? If so, citation should be provided. Or do they follow from assessment in underlying chapter sections? If so, line-of-sight references could be provided. (Mach, Katharine, IPCC WGII TSU)
346	20	13	16	13	16	Suggest inserting "EXAMPLES OF Elements..." Authors could delete "for Sustainable Development" (UNITED STATES OF AMERICA)
347	20	13	16	13	40	Box 20-5. Who are the agents of these actions? States, individuals, donor agencies? Make more clear who is addressed by this (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
348	20	13	16	13	41	Climate-resilient pathways are composed by more elements, for example, resource management. (Sosa-Rodriguez, Fabiola S., University of Waterloo)
349	20	13	20	13	20	global is not needed here. (UNITED STATES OF AMERICA)
350	20	13	27	13	28	note that standards are an established method for transferring knowledge to practice. (Wright, Richard, Retired, U.S. National Institute of Standards and Technology)
351	20	13	39	13	39	Revise to, "Effective programs to assist the most vulnerable populations and systems in coping with impacts of climate change and benefiting from the sustainable development dividend. (Harsdorff, Marek, ILO)
352	20	13	44	13	44	Excellent point! It is the conditions created to maintain the process that are adaptation. These include adaptation knowledge, development of local capacity, inter-generational transfer of knowledge, holistic decision-making in which intersecting interests make decisions together to achieve results that do not work at cross purposes, temporal planning, etc...) (At this point in the document it is not clear if climate resilient pathway is at all an improvement over adaptation as a term. (UNITED STATES OF AMERICA)

#	Ch	From Page	From Line	To Page	To Line	Comment
353	20	13	49	13	51	This is good to say but how far is it feasible under the current democratic and socio-economic systems? It could be that there is need to add a sentence reflecting on realities/potential constraints of achieving adaptive management under the current systems. (Dube, Pauline, University of Botswana)
354	20	14	0	0	0	Box 20-6. One UN convention--CBD--has put a moratorium on geoengineering. To suggest geoengineering as an option means working at cross-purposes with a sister convention. Earlier IPCC reports have discouraged geoengineering as an option. In fact, corporates and major countries are not taking action on mitigation only in the hope that they will get a go ahead for geoengineering. (Gupta, Himangana, Panjab University, Chandigarh, India)
355	20	14	3	0	4	While geengineering being a "research priority" is the view of perhaps two high-profile / powerful governments (UK, USA), it cannot be considered "the more general view." Our suggested wording: "While some advocates argue that geoengineering is needed now in order to avoid irreversible impact such as the loss of ocean corals, most governments have not begun to consider geoengineering a decision-making option. The UK government is a notable exception and considers geoengineering a research priority (NRC, 2010b)." (Mooney, Pat Roy, Action Group on Erosion, Technology and Concentration (ETC Group))
356	20	14	3	14	3	What is meant by "integrated mitigation and adaptation strategies" could be clarified. Also, how do entry points such as vulnerability reduction and transformation relate to these categories? (Mach, Katharine, IPCC WGII TSU)
357	20	14	3	14	4	Expand the discussion about how reliance can be increased through climate change responses. (Sosa-Rodriguez, Fabiola S., University of Waterloo)
358	20	14	3	14	4	It could be useful here to briefly explain distinction being made between the first/second categories and the third category. (Mastrandrea, Michael, IPCC WGII TSU)
359	20	14	4	0	0	DELETE: "Related to these responses but generally considered" so that the sentence reads: "A separate response issue is 'geoengineering' (Box 20-6)." (Mooney, Pat Roy, Action Group on Erosion, Technology and Concentration (ETC Group))
360	20	14	4	14	4	Geoengineering is a type of mitigation. (UNITED STATES OF AMERICA)
361	20	14	6	14	41	Box 20-6 The same as above, but at a more detailed level. It is not known what geoengineering means for sustainable development. The box also refers to WGIII Chapter 6 that considers geoengineering as part of their transition pathways. WG3 Ch6 however takes geoengineering as if it worked already without any adverse effects and therefore gives an untrue impression to the reader. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
362	20	14	6	14	41	The box on geo-engineering is quite long compared to the other sections in 20.3 (consider also the reminder to WGIII and the purpose of this chapter at the beginning of 20.3.1). I would suggest to shortening or at least putting it at the end of section 20.3, not at the beginning. (ITALY)
363	20	14	8	0	0	Why are you giving such an important to geoeengineering options? There are great uncertainties and concerns about the proposed procedures... Giving that much space in the WGII (Robledo Abad, Carmenza, HELVETAS Swiss Intercooperation)
364	20	14	8	0	0	Box 20-6 does not fit in under 'resilience through climate change responses' section. Since so little is known about the consequences of geoengineering it would be best to place it later in the chapter. (Chatterjee, Monalisa, IPCC WGII TSU)
365	20	14	8	0	39	I suggest to quote Paul J. Crutzen paper: "Albedo Enhancement by Stratospheric Sulphur Injections: A Contribution to resolve a policy dilemma? An editorial essay. Climatic Change(2006) 77:211-219. DOI:10.1007/s 10584-006-9101-y (Muylaert de Araujo, Maria Silvia, Federal University of Rio de Janeiro)
366	20	14	8	14	39	This section could include a discussion of consideration of who/what nation/group of nations is responsible or can be responsible for the deployment of geoengineering solutions? Is it possible to reach international agreement on thier use and trialing? (AUSTRALIA)

#	Ch	From Page	From Line	To Page	To Line	Comment
367	20	14	8	14	39	This does not mention the issues surrounding cessation of geoengineering. If geoengineering techniques are used, some studies have shown following termination there could be rapid rises in temperature back towards the trajectory without geoengineering. This could potentially result in adaptation issues, particularly in ecosystems. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
368	20	14	8	14	39	Box 20-6: Please refer to the Expert Meeting and Report, plus refer to WGI AR5 Ch6/7 for the assessment of the physical science basis of Geoengineering, rather than providing your own summary assessment. Please note that WGI AR5 has to be cited in this context. (Plattner, Gian-Kasper, IPCC WGI TSU)
369	20	14	10	14	10	Change `to the extent` to `in case` \n\n (NETHERLANDS)
370	20	14	10	14	10	This opening clause seems to negate the fact that there will already be things that will have unacceptable outcomes for some people. It is not clear that rate of emission or adaptation will help places like the Maldives. This clause is a bad way to set up the conversation about geoengineering. Suggest removing this value laden clause and just dive in with a new clause at the beginning of the 2nd paragraph. (UNITED STATES OF AMERICA)
371	20	14	10	14	13	Sentence is too long and needs restructuring to be easier understandable, example: Climate change mitigation might not be fully successful in moderating the rate of increase in GHG emission and climate change adaptation in coping with the resulting impacts without socially unacceptable pain and distress. In that case policymakers may be faced with demand to find further ways to reduce climate change and its effects. \n\n (NETHERLANDS)
372	20	14	11	14	11	Concentrations would make more sense than "emissions" in this context. (Mastrandrea, Michael, IPCC WGII TSU)
373	20	14	15	0	0	The first sentence of the ES is misleading. Sustainable development per se needs to "take into account complex interactions between climate and social and environmental systems". Inclusiveness of "climate" aspects is not that new in SD. The question is if, why and which new approaches are needed because of this specific climate change. I agree that this is a good entry point, but it should/could be more to the point. As stated now it becomes meaningless and doesn't show any new view for the 5AR, but only similar findings as already said in the 4AR as well as in the SREX. The first sentence of the introduction seems to me to be a better entry point for the ES as well. Why? Because in this sentence you clarify the scope of the chapter (Robledo Abad, Carmenza, HELVETAS Swiss Intercooperation)
374	20	14	15	14	15	It is not advisable to subsume potential geoengineering approaches under mitigation/adaptation strategies. Please reformulate, e.g.: "Such options include potential geoengineering, in addition to mitigation and/or adaptation." (GERMANY)
375	20	14	15	14	17	From any viewpoint (physical, philosophical, etc.) geoengineering is a separate option directed to modification of Earth climate system. It can be applied (if needed) in parallel with "mitigation" and "adaptation". It is very important to say that geoengineering could be used if mitigation measures will not be able to prevent unacceptable global temperature rising and to avoid climatic crisis (see page 27, lines 43-50). (Ryaboshapko, Alexey, Institute of Global Climate and Ecology)
376	20	14	15	14	17	Please sharpen/ rectify your definition of geoengineering (our understanding: SRM aiming at reducing the short-wave solar radiation input, enhancing its reflection, or at increasing the long-wave thermal radiation to space; and CDR at reducing/extracting CO2 in/from the atmosphere). Furthermore check consistency with other definitions of geoengineering in AR5/ WG II. (GERMANY)
377	20	14	15	14	19	there should be a lot of scientific publications on geo- engineering\n\n (NETHERLANDS)
378	20	14	21	14	21	The text overestimates the role and contribution of geoengineering. (Constantinos Cartalis, Environmental Physics, University of Athens, Greece) (GREECE)
379	20	14	21	14	28	It would be useful to consider and cross-reference the treatment of these topics in other chapters, such as Chapter 19. (Mastrandrea, Michael, IPCC WGII TSU)

#	Ch	From Page	From Line	To Page	To Line	Comment
380	20	14	21	14	39	Are there no more recent references of note on geoengineering? (UNITED STATES OF AMERICA)
381	20	14	22	14	22	For this history see Fleming 2010. (Fleming, James Rodger, Colby College)
382	20	14	22	14	22	If this is a list of key works that started the discussion, then include this: Crutzen, P. J. (2006). "Albedo Enhancement by Stratospheric Sulfur Injections: A Contribution to Resolve a Policy Dilemma? An Editorial Essay." Climatic Change 77: 211-220 (UNITED STATES OF AMERICA)
383	20	14	22	14	23	Please consider the large uncertainties attached to geoengineering and reformulate, e.g.: "Some of the possible options are known to be technically feasible, but their effectiveness and efficiency, especially on a large scale, and their side-effects are exceeding poorly understood..." (GERMANY)
384	20	14	24	0	0	'Linten' should be 'Lenton'. (Vivian, Chris, IMAREST)
385	20	14	25	14	25	Not being expensive only refers to direct costs. Therefore please add "...as for their direct costs (without external effects)". (GERMANY)
386	20	14	26	14	26	A social acceptance can not be expected for all CDR techniques. Please add "SOME interventions to increase..." (GERMANY)
387	20	14	26	14	28	expensive -- These two sentences convey Barrett (2008) incorrectly. Instead Barrett's whole article is about how *cheap* geoengineering may be compared to mitigation. Granted, there are several causes for pause with geoengineering. However, the costs may be incredibly cheap -- indeed that is the title of his article, "The Incredible Economics of Geoengineering." If the costs of geoengineering are an issue to cover, then another source to look at would be Goes, M., N. Tuana, et al. (2011). "The Economics (or Lack Thereof) of Aerosol Geoengineering." Climatic Change 109: 719-744., which addresses why the economics of aerosol geoengineering may not be so attractive, due to high risk. (UNITED STATES OF AMERICA)
388	20	14	27	14	27	economically very expensive, with the latest estimates of \$1000 US per tonne for air capture, and energetically nearly impossible at 400 kJ per mole of CO2 removed (House, K.Z, et al. 2011). To date, there has been little experience of large-scale CO2 disposal, geological retention times, leakage rates, possibility for catastrophic failure, and other issues.\n(Toth , ed. 2011). (Fleming, James Rodger, Colby College)
389	20	14	30	14	32	who are some advocats?, you are speaking of some but then only provide one source, also please specify who they are\n\n(NETHERLANDS)
390	20	14	30	14	39	Box 20.6. Is there a limited time window for such interventions? Can these measures still be applied if the climate has already been changed in a dangerous way, e.g. after certain tipping points have been reached? What are the cost estimates of the various options? If this topic is given the importance to be included in this report at all, these considerations should be addressed as well. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
391	20	14	32	14	37	The sentence is too long and difficult to follow (Dube, Pauline, University of Botswana)
392	20	14	33	14	37	split the sentence and rephrase for easier understading: The challenge are: to understand what geoenginerring options would do to moderate climate change and ttheir ancillary effetcts. This would allow future policy to react fast in case of needdue to to severe disruptions. \n\n(NETHERLANDS)
393	20	14	34	14	34	This phrase gives the impression we could reach a total understanding on climate engineering and its effects and side effects. Facing the complex system interactions this will never be the case. Therefore please add: " ancillary effects AND RISKS might be" (GERMANY)
394	20	14	34	14	34	Suggest deleting "some decades from now" as it is presumptuous to assume there will be no time before then when policymakers want to consider these things. (UNITED STATES OF AMERICA)
395	20	14	36	14	37	Please also add r i s k s to "potential cost and benefits". (GERMANY)

#	Ch	From Page	From Line	To Page	To Line	Comment
396	20	14	37	14	39	You say that some observers propse... but then you only give one source. Please provide more literature. \n\n (NETHERLANDS)
397	20	14	39	0	0	After line 39 referring to the lack of agreed criteria for experimentation, there should be a discussion of the multilateral decisions to-date, such as this: "The only multilateral decisions on geoengineering technologies to-date are those established at the Convention on Biological Diversity (CBD) on ocean fertilization (2008) and all geoengineering activities that may affect biodiversity (2010) -- both decisions are generally considered de facto moratoria, in light of the current state of scientific uncertainty. A decision of the London Convention/Protocol holds that, given the uncertainty surrounding negative impacts, ocean fertilisation other than 'legitimate scientific research' should not be permitted. The London Convention/Protocol has established an assessment framework, including criteria for determining legitimate scientific research. The environmental modification treaty (ENMOD), which prohibits the hostile use of weather modification, also has relevance for the governance of geoengineering. See ETC Group 2012. (ETC Group, "Darken the sky and whiten the earth: The dangers of geoengineering," _Development Dialogue_ no. 61, September 2012, pp. 210-237) and The CBD's Technical Series papers on geongineering impacts: CBD study on the impacts of climate-related geoengineering on biological diversity (UNEP/CBD/SBSTTA/16/INF/28) and CBD study on the possible impacts of geoengineering techniques on biodiversity and associated social, economic and cultural considerations (UNEP/CBD/SBSTTA/16/INF/30). (Mooney, Pat Roy, Action Group on Erosion, Technology and Concentration (ETC Group))
398	20	14	46	14	47	This text rephrases the UNFCCC outcomes on 2 degrees in a way that changes the meaning of what was agreed. Parties never agreed on an upper limit for dangerous climate change. Authors need to cited exactly political decisions because efforts to paraphrase can gloss over carefully negotiated language. (UNITED STATES OF AMERICA)
399	20	14	46	14	47	This text rephrases the UNFCCC outcomes on 2 degrees in a way that changes the meaning of what was agreed. Parties never agreed on an upper limit for dangerous climate change. Authors need to cited exactly political decisions because efforts to paraphrase can gloss over carefully negotiated language. (UNITED STATES OF AMERICA)
400	20	14	46	15	32	First you said there is a twofold interaction and then you mentioned a third option. This makes the paragraph a little bit confusing. I would recommend to list the three possible interactions in the first paragraph (S.14 starting in line 52) and then explain one by one (Robledo Abad, Carmenza, HELVETAS Swiss Intercooperation)
401	20	14	54	14	54	In the terminology of the special report, "climate extremes" is synonymous with "extreme weather and climate events," which is synonymous with "extreme events" as introduced in the summary for policymakers. Thus, it might be clearest to use a single phrase here. (Mach, Katharine, IPCC WGII TSU)
402	20	15	0	0	0	There is no mention to the financial linkages between adaptation and mitigation in the context of SD. The CDM provides meaningful financig to the adaptation fund. As the CDM has to fulfill SD criteria and this projects provide further financial means for the adaptation fund, CDM (mitigation) activities engaged in SD are delivering money for adaptation. (Robledo Abad, Carmenza, HELVETAS Swiss Intercooperation)
403	20	15	1	15	1	give the source of the original document of COP15 and not a secondary source\n\n (NETHERLANDS)
404	20	15	1	15	1	was this not an official request from SIDS , check if there is an original document and instead of saying that many small developed nations said something mention the precise group (we guess it was the small island development states"\n\n (NETHERLANDS)
405	20	15	1	15	7	The text here references negotiating positions, not actual decisions/agreement among Parties or science itself. Therefore, the exsting text should be delteted and repalced with actual outcomes/decision text from the relevant COP(s). (UNITED STATES OF AMERICA)

#	Ch	From Page	From Line	To Page	To Line	Comment
406	20	15	3	15	3	Later you are writing that those islands would cease to exist with a temperature increase of already 1.5 degrees. As result a 2 degrees increase would lead to unacceptable impacts on their change of survival and not as written on sustainable development. It is obvious that if the island ceases to exist that there cant be any sustainable development on it but no unsustainable development either.\n\n (NETHERLANDS)
407	20	15	3	15	4	Please provide the likely increase in temperature for the 450ppm target so as to be consistent with the other targets given\n\n (NETHERLANDS)
408	20	15	8	15	8	Insert paragraph split at "Second" (UNITED STATES OF AMERICA)
409	20	15	13	15	15	In might be the case that the large scale deployment of renewable energy sources leads not an increase in energy price but does not have to be per seThe statement sounds populist and there is research showing the opposite, e.g. for a remote island state importing fuels using their local potential in renewable energies can decrease prices. Look for example at: http://www.sciencedirect.com/science/article/pii/S1364032109001348 , http://www.sciencedirect.com/science/article/pii/S0960148103002520 In the Renewable Energy Sources and Climate Change Mitigation Special Report of the Intergovernmental Panel on Climate Change it is stated that 'Some RE technologies are broadly competitive with existing market energy prices. Many of the other RE technologies can provide competitive energy services in certain circumstances, for example, in regions with favourable resource conditions or that lack the infrastructure for other low-cost energy supplies. In any case, please provide a peer- reviewed article as source.' \n\n (NETHERLANDS)
410	20	15	13	15	15	Please provide a peer- reviewed article as source.\n\n (NETHERLANDS)
411	20	15	15	15	22	The sentence expresses an ideal situation that we all wish for i.e. a change that occurs without disrupting the development process and where economic growth is sustained– but is it achievable (than for the specific sub-sector e.g. given here even then it is not clear if it can meet needs of rising demand)? This also gives the impression that rising demand can be maintained all we need is technology (Dube, Pauline, University of Botswana)
412	20	15	18	15	18	What demands are you referring to? \n\n (NETHERLANDS)
413	20	15	19	15	19	Suggest writing ... 'increasing carbon uptake and decreasing carbon loss'... (AUSTRALIA)
414	20	15	19	15	19	You have not been talking about strategies before. Are you referring to climate resilient pathways as written in the previous sentences?\n\n (NETHERLANDS)
415	20	15	19	15	19	what are better agricultural management practices? You should explain better, otherwise the link between reducing net emission and reducing the workload of women is unclear\n\n (NETHERLANDS)
416	20	15	19	15	22	The structure makes the sentences not clear. Change to: Climate resilient pathways could consist in better agricultural management practices. These can reduce net emissions, improve soil water storage capacity, combined with measures in conservation tillages which increase water retention in drought conditions and help to sequester carbon in the soil. \n\n (NETHERLANDS)
417	20	15	21	15	21	The sudden mention of women is not clear. Why women? (Dube, Pauline, University of Botswana)
418	20	15	24	15	24	if you are talking here about a third option please change on page15 line 52 that there are 3 and not 2 options\n\n (NETHERLANDS)
419	20	15	24	15	24	no new paragraph needed\n\n (NETHERLANDS)
420	20	15	24	15	24	reomove 'however', it does not make sense here.\n\n (NETHERLANDS)
421	20	15	24	15	33	20.3.1. Add here governance structures and legal frameworks such as security of tenure to mitigative capacities (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)

#	Ch	From Page	From Line	To Page	To Line	Comment
422	20	15	34	15	34	it should be written to include table 20-1 and not 20-2 or the other way around, but the number given in the title is not consistent with the number given for table insertion\n\n (NETHERLANDS)
423	20	15	34	15	34	if it is table 20-2: it is not clear how the table connects to the text, also it is not explained what the table shows and is not interpretable without a description\n\n (NETHERLANDS)
424	20	15	34	15	34	if it is table 20-1: it is not clear how the table connects to the text, \n\n (NETHERLANDS)
425	20	15	34	15	34	for table 20-1 it is not clear why the respective countries where chosen as examples, it would be more interesting to add a column saying if they are mandatory goals, without a longer explanation many of the innovation actions do not make sense to the reader (e.g. what is meant by investment platform, peaking objectives, what are low carbon zones?)\n\n (NETHERLANDS)
426	20	15	34	15	34	is is not clear what the innovation in the actions of the chosen countries is, e.g. many countries have an Environmental Council and not only Japan, many countries have public resources commitment and not only South Korea, many countries have a 2050 time horizon and not only Mexico, We would say the table is not appropriate to show innovative policy making and it would be better to choose other leading innovatory examples\n\n (NETHERLANDS)
427	20	15	35	15	35	Table 20-2 should be deleted. It has less to do with the text. In addition, it does not show the most resent plans. (HAYASHI, Ayami, Research Institute of Innovative Technology for the Earth (RITE))
428	20	15	35	15	35	This should be Table 20-2. (Mastrandrea, Michael, IPCC WGII TSU)
429	20	15	44	15	44	It is difficult to understand how the following paragraphs connect. You are saying: "Overall, adaption is linked to sustainable developement in several ways". Then we would briefly give an an overview on the three linkages you are describing in the subsequent paragraphs. If we understand correctly you can write: "Overall, adaption is linked to sustainable developement in three ways: First through the capacity of communities to adapt to climate change, second through capacity building sustainable developement and thirdly may require transformational changes having an impact on the pathay of sustainable development." \n\n (NETHERLANDS)
430	20	15	45	15	45	please state what you understand as capacities. It is not clear to me.\n\n (NETHERLANDS)
431	20	15	47	15	47	What about locally? (Sosa-Rodriguez, Fabiola S., University of Waterloo)
432	20	15	47	15	50	This is not necessary the case - in many traditional socieities (such as Pacific Islands, or the Lozi people of the Barotse floodplain) indicators of development remain low, yet the population has a high adaptive capacity. (Bettencourt, Sofia, World Bank)
433	20	15	50	15	50	We would use significant only if it has been quantified, it is not clear to us if that was the case\n\n (NETHERLANDS)
434	20	15	50	15	53	Add after the sentence "However, building these capacities both in developed and less developed regions has implications to sustainable development in terms of increasing the consumption of materials and potential negative effects on ecosystems (e.g. buidling of new infrastructure and consumption)." "However, employment intensive local resource-based approaches, where local social and cultural values are taken into consiration, can ensure that the potential negative effects are minimized, and that the development is done in an inclusive way benefiting the most vulnerable." (Local Resource-based Approaches for Infrastructure Investments Source Book - ILO Sub regional office for Southern Africa, Harare, Zimbabwe, 2010) (Harsdorff, Marek, ILO)
435	20	15	51	15	53	The definition of sustainable development seems narrow here. A focus on economic development will have these consequences. (Chatterjee, Monalisa, IPCC WGII TSU)
436	20	16	11	16	11	when adaptation planning stimulates participatory social processes. This applies to all decisions, adaptation does not imply per se participatory process. A little bit speculative, unless clear evidence on that. (ITALY)
437	20	16	15	16	15	no new paragraph needed\n\n (NETHERLANDS)

#	Ch	From Page	From Line	To Page	To Line	Comment
438	20	16	15	16	16	Distinction should be made between climate change that is locked in over the next few decades and levels of climate change in the 2nd half of the 21st century, where mitigation choices now and in the coming decades are relevant. The chapter team could consider my overall comment on "characterization of future risk" and the framing of the eras of climate responsibility and climate options. (Mach, Katharine, IPCC WGII TSU)
439	20	16	15	16	19	As commented on page 12, this sentence can be read to imply that significant impacts from climate change are inevitable. It would be useful to provide a clearer sense that there is a timeframe over which impacts are largely a result of past emissions and inertias in climate and socioeconomic systems (and thus impacts can mainly be reduced through adaptation in the shorter-term) and a longer-term timeframe over which impacts are largely a result of the decisions we make now and going forward (in which impacts can be reduced through mitigation starting in the shorter-term and adaptation in the longer-term). (Mastrandrea, Michael, IPCC WGII TSU)
440	20	16	19	16	21	Change the sentence: Desirable adaption strategies may vary according to the specific type of climate change threat, the location, the impacts on the system, the geographical scope and the timeframe...\n\n (NETHERLANDS)
441	20	16	19	16	21	For example, in Mexico, climate change impacts differ by region (the north, center and south), and so, mitigation and adaptation strategies implemented (Sosa-Rodriguez, 2013). (Sosa-Rodriguez, Fabiola S., University of Waterloo)
442	20	16	25	16	28	The example of Vietnam indicates how an adaptation option benefiting one user group can affect the LIVELIHOODS of another group - and not necessarily their adaptive capacity. Perhaps you should consider a more typical example, such as how construction of seawalls by one coastal community can affect erosion in adjacent beaches, or how protection dykes can induce maldaptation (by giving people a false sense of security and attracting them to floodplains). (Bettencourt, Sofia, World Bank)
443	20	16	30	16	36	Adaptation pathways seem very similar to sustainable development, however the chapter seems to imply that these two are different. (Chatterjee, Monalisa, IPCC WGII TSU)
444	20	16	31	16	35	Adaptation pathways promotes gender equality (any reference? Or speculative? I do not think women can be today generally considered "marginalized groups", even though this is true in some countries) (ITALY)
445	20	16	33	16	36	Include "and by ensuring that adaptation is carried out through inclusive local resource-based approaches (ILO 2011)" to "By selecting environmentally friendly materials; promoting energy, water and other resources conservation; promoting re-use and recycling; minimizing waste generation; protecting habitat and addressing needs of marginalized groups (Bizikova et al., 2007, Seto et al., 2010) and by ensuring that adaptation is carried out through inclusive local resource-based approaches (ILO 2011), adaptation can contribute to win-win or even triple win options that can support a diverse array of development goals." The combined use of local participation in planning with the utilization of locally available skills, technology, materials, and appropriate work methods has proven to be an effective, economical and environmentally viable approach to employment intensive works, especially in countries where there is high unemployment and a shortage of skills. (Local Resource-based Approaches for Infrastructure Investments Source Book - ILO Sub regional office for Southern Africa, Harare, Zimbabwe, 2010) These kinds of works can create sustainable client-resilient assets, while ensuring minimal use of capital intensive equipment and reinforcing the protection and rehabilitation of natural resources, and at the same time can offer employment and income security to the most vulnerable making it a true multiple win situation. (Harsdorff, Marek, ILO)
446	20	16	33	16	36	This is not a full sentence. Change to: Better integration can be achieved by selecting environmental friendly materials... If this integration is succesfly implemented adaption can lead to win- win...\n\n (NETHERLANDS)
447	20	16	33	16	36	For energy there is need to add renewable energy in addition to conservation (Dube, Pauline, University of Botswana)
448	20	16	36	16	36	the numbering of the sections is not coherent: delete the last point in section 20.3.3. to 20.3.3\n\n (NETHERLANDS)
449	20	16	36	16	36	Not clear what is meant by triple win as opposed to win-win. (UNITED STATES OF AMERICA)

#	Ch	From Page	From Line	To Page	To Line	Comment
450	20	16	39	0	0	Section 20.3.3: In section 20.3.3 authors should take care not to be overly presumptuous and overstate that integration between adaptation and mitigation in and of itself should be a policy goal. There are interactions, synergies and tradeoffs, but there's also the case to be made that many of these actions are de-coupled from a policy makers standpoint, e.g., pursuing fuel efficiency standards for cars and building sea walls. (UNITED STATES OF AMERICA)
451	20	16	39	0	0	This section and also other parts of the chapter can benefit from the book on "Palutikof J., Boulter, S., Ash, A.J. et al., 2013. Climate Adaptation Futures. Wiley-Blackwell" (Dube, Pauline, University of Botswana)
452	20	16	41	0	50	This paragraph includes a fundamental message of the IPCC which has been stated since the TAR that needs to be reinforced as there are always newcomers to the climate change field unfamiliar with past reports; and therefore, we strongly suggest that a summary is included in the Executive Summary of this chapter and in the SPM and TS as well, as a starting point. (JAPAN)
453	20	16	41	16	41	Casual usage of "likely" should be avoided as it is a reserved likelihood term. (Mach, Katharine, IPCC WGII TSU)
454	20	16	43	0	0	you could also cite here Viguié, Vincent, and Hallegatte, Stéphane . 2012. « Trade-offs and Synergies in Urban Climate Policies ». Nature Climate Change 2 (5) (mars 4): 334-337. doi:10.1038/nclimate1434. (Viguié, Vincent, CIRED)
455	20	16	46	16	46	What is No. "345" after Wilson and McDaniels, pl. correct it (Goheer, Arif, Global Change Impact Studies Centre (GCISC))
456	20	16	46	16	46	The year after the reference is not correct Wilson and MacDaniels, it should be 2007 (NETHERLANDS)
457	20	17	5	17	8	While this may be true at a cross-country level and international level, in general adaptation involves a wider range of multi-agency responsibilities than mitigation, which falls more clearly within the mandates of Environmental or Forestry agencies. (Bettencourt, Sofia, World Bank)
458	20	17	12	17	14	How is additionality a hurdle or an issue for integrating mitigation and adaptation? (UNITED STATES OF AMERICA)
459	20	17	12	17	15	I would avoid using twice "while". Replace the second with ", " (ITALY)
460	20	17	12	17	16	This sentence is not clear. Please split it into several ones and reformulate. (NETHERLANDS)
461	20	17	16	18	12	While co-benefits may be so large in some cases to fully offset mitigation costs so that the net costs are negative, the existence of these untapped win-win situations raises questions about whether they are in fact so easily achievable. There may be large legal, political, economic, or institutional obstacles that keep them from happening. Also, the usual Marginal Abatement Cost Curve (MACC) graphs that show the net costs fail to highlight the gross costs and benefits because they combine the two into a single measure. This obscures information that is very important for decision making. It would be best to use a different graphic that clearly shows gross costs, benefits, and net costs. (UNITED STATES OF AMERICA)
462	20	17	18	0	0	Why are (a) and (b) different? (b) could be part of (a) (Robledo Abad, Carmenza, HELVETAS Swiss Intercooperation)
463	20	17	18	17	19	20.3.3. Consider differentiating mitigation and adaptation on the grounds of the one being a global public good and the other rather a national development priority (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
464	20	17	19	17	19	delete 'more', in the highly vulnerable countries (NETHERLANDS)
465	20	17	19	17	19	Add reference to Dang, Hanh; Michaelowa, Axel; Tuan, Dao (2003): Synergy of adaptation and mitigation strategies in the context of sustainable development: the case of Vietnam, in: Climate Policy, 3, Supplement 1, p. S81-S96 (Michaelowa, Axel, University of Zurich)
466	20	17	21	17	26	Not clear why 2010-2012 is mentioned here. Earlier extreme events have also highlighted this problem, e.g. Hurricane Katrina in US. Also the examples given here are mainly US focused. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
467	20	17	22	17	26	Reference for paragraph missing: Yet major loss... (NETHERLANDS)

#	Ch	From Page	From Line	To Page	To Line	Comment
468	20	17	24	17	26	Also, mitigation is seen by some developed countries as an investment opportunity for their domestic private sector. (Bettencourt, Sofia, World Bank)
469	20	17	28	17	39	The possibilities of triple win that integrate climate and development under sustainable development has to be explained in the beginning of the chapter and a conceptual diagram to illustrate the interactions will be useful for readers. (Chatterjee, Monalisa, IPCC WGII TSU)
470	20	17	29	17	29	Concerning the `triple- win` situations, Are you refering to section 20.3.3?, if yes state it \n\n (NETHERLANDS)
471	20	17	30	17	35	Also to be included in the list of factors to consider in the triple-win interventions is dealing with uncertainty (Dube, Pauline, University of Botswana)
472	20	17	36	17	36	For the described path dependency, distinction should be made in terms of climate change that is locked in over the next 2 decades as compared to levels of climate change where mitigation choices and emissions trajectories are of paramount importance. The chapter team could consider my overall comment on "characterization of future risks" and the framing of the eras of climate responsibility and climate options. (Mach. Katharine. IPCC WGII TSU)
473	20	17	38	17	38	what do you mean by `because trade offs were not avoided`, can you please give an example \n\n (NETHERLANDS)
474	20	17	41	17	42	Mitigation and Adaptation (M&A). M&A should be anticipated at the first time they are jointly mentioned (ITALY)
475	20	17	41	17	50	After the example about Bangladesh, I think the authors could mention that land management activities (including agriculture and forestry) have a high potential for synergies between adaptation and mitigation. Land management and forestry activities contribute to ecosystem-based mitigation, for example through the reduction of emissions from deforestation and forest degradation, and adaptation, for example through the conservation of hydrological services provided to people facing water problems (see several cases of ecosystem-based adaptation in Pramova et al., 2012). But trade-offs are possible, for example if ecosystem management for mitigation purposes reduces the livelihood opportunities and the adaptive capacity of local people (Locatelli et al., 2011)\n[Pramova E., Locatelli B., Djoudi H., Somorin O., 2012. Forests and trees for social adaptation to climate variability and change. WIREs Climate Change 3:581–596. doi: 10.1002/wcc.195] \n[Locatelli B., Evans V., Wardell A., Andrade A., Vignola R., 2011. Forests and Climate Change in Latin America: Linking Adaptation and Mitigation. Forests 2(1): 431-450. doi:10.3390/f2010431] (Locatelli, Bruno, CIRAD-CIFOR)
476	20	17	43	17	43	for the other options you give examples, please also provide one for `reducing costs`\n\n (NETHERLANDS)
477	20	18	8	18	12	it is not clear if you are in all examples (from agriculture and water until urban environment) referring to the effects of biofuel production\n\n (NETHERLANDS)
478	20	18	12	0	0	you could also cite here Viguié, Vincent, and Hallegatte, Stéphane . 2012. « Trade-offs and Synergies in Urban Climate Policies ». Nature Climate Change 2 (5) (mars 4): 334?337. doi:10.1038/nclimate1434.\n (Viguié, Vincent, CIRED)
479	20	18	15	0	0	I suggest to consider the following publication about case studies on resilience of Argentina, Brazil, Bangladesh, Senegal and Zimbabwe: "Seeing the Light: Adapting to climate change with decentralized renewable energy in developing countries". Edited by Henry venema and Moussa Cisse. IISD. 2004. (Muylaert de Araujo, Maria Silvia, Federal University of Rio de Janeiro)
480	20	18	22	18	22	Reference to Folke et al.2002....do we need to keep this reference in? This was already quoted in the fourth Assesment Report and might not be useful to repeat this again and just keep the references for year 2009? (Yuzva, Kristina, United Nations University Institute for Environment and Human Security (UNU-EHS))
481	20	18	25	0	0	Short term benefits can represent a trafeoff for long term adaptation. Temporal scale of the benefits from mitigation and adaptation in the context of SD should be discussed (Robledo Abad, Carmenza, HELVETAS Swiss Intercooperation)

#	Ch	From Page	From Line	To Page	To Line	Comment
482	20	18	25	19	26	This section (20.4.1) on trade-offs between economic and environmental goals would benefit from some discussion on green growth. For example: http://www.oecd.org/greengrowth/47984000.pdf . (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
483	20	18	27	18	46	Sometimes sustainable development sounds too much like ust economic development. The difference needs to consistently clarified. (Chatterjee, Monalisa, IPCC WGII TSU)
484	20	18	34	18	34	The statement seems incorrect. The very idea of sustainable development itself springs from forest management and was named first by Hans Carl von Carlowitz 1713 in his work entitled „Sylvicultura Oeconomica“\n\n (NETHERLANDS)
485	20	18	35	18	35	Replace "Malthusian" with "Neo-Malthusian" (UNITED STATES OF AMERICA)
486	20	18	41	18	41	Malthus was writing about agricultural production and consumption. He did not address broader issues or the environment. (UNITED STATES OF AMERICA)
487	20	18	42	18	46	Sentence is unclear. Please rewrite. \n\n (NETHERLANDS)
488	20	18	45	18	45	it is not understandable what `resolving s host of tradeoffs` means\n\n (NETHERLANDS)
489	20	18	45	18	45	Eliminate the “s” (Sosa-Rodriguez, Fabiola S., University of Waterloo)
490	20	18	48	18	48	it is not clear of which tradeoffs you are speaking, do you mean tradeoffs between economic growth and environmental management, please state it clearly\n\n (NETHERLANDS)
491	20	19	6	19	20	It is implied that 'additional' projects and projects with co-benefits are two different approaches and mutually exclusive. However, it is possible to have an 'additional' project that has co-benefits. Also, not sure that the need for additional adaptation projects has stemmed from additionality principle in mitigation but rather more broadly from the need to account for required development aid. (AUSTRALIA)
492	20	19	14	19	14	A website is included here, should the IPCC only state relevant peer review sources and not websites? I suggest leaving this out. (Yuzva, Kristina, United Nations University Institute for Environment and Human Security (UNU-EHS))
493	20	19	14	19	14	the style of reference is incorrect: put the link to the website under the reference section and not in the middle of the text, is there no peer reviewed article describing the Co-benefits Approach instead of this website?\n\n (NETHERLANDS)
494	20	19	15	19	15	give a reference for REDD\n\n (NETHERLANDS)
495	20	19	16	19	16	Please provide more references for Reserarch on externalities, the one you are providing is old (1989)\n\n (NETHERLANDS)
496	20	19	17	19	20	Assessing extrenalities a la Baumol and Oates, 1989 is not the only method. Economist also use Multi Criteria Analysis (see for example http://www.mca4climate.info/) there are large scale simulation models that allow for asessing co-benefits (for example Barker, T., A. Anger, U. Chewpreecha, and H. Pollitt (2012) A new economics approach to modelling policies to achieve global 2020 targets for climate stabilisation, International Review of Applied Economics, vol. 26, no. 2) Some of the marthods are discussed in Chapter 17, section 17.6.3 (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
497	20	19	19	19	26	Replace "participative" with "participatory" (UNITED STATES OF AMERICA)
498	20	19	23	19	23	what is meant by `untidy` social processes?\n\n (NETHERLANDS)
499	20	19	23	19	23	Is this a standard usage of "evolution" within the literature? If not, usage here could be reconsidered. (Mach, Katharine, IPCC WGII TSU)
500	20	19	31	20	53	Identify key characteristics that institutions need to develop in order to promote effective sustainable development and climate-resilient strategies. (Sosa-Rodriguez, Fabiola S., University of Waterloo)
501	20	19	33	19	37	Delete repetition (UNITED STATES OF AMERICA)

#	Ch	From Page	From Line	To Page	To Line	Comment
502	20	19	41	0	0	The example given in REDD+ is not accurate: First, there is not yet clarify about this mechanism as it is still under negotiatio, Second; the excercises using REDD+ (or similar mechanisms) are very new and research on impacts on SD from REDD+ is still very contested. I recommend to use other, better documented example, for ilustrating the point here (Robledo Abad, Carmenza, HELVETAS Swiss Intercooperation)
503	20	19	43	19	43	what means forthcoming for the citation of Denton? Is there no preliminary publication date available?\n\n (NETHERLANDS)
504	20	19	53	20	2	The sentence is not clear to me. Do you want to say that if in a specific country there are no organisational mechanism in place external policy support can catalyze adaption measures?\n\n (NETHERLANDS)
505	20	19	54	19	54	provide a reference for stating that organizational mechanisms are central to building linkages between...\n\n (NETHERLANDS)
506	20	19	54	20	2	This is not the case for Mexico. Similar to Mexico, in other countries some form of organizational mechanism should build linkages between the local and federal institutions. For example, "To support collaboration among federal and regional agencies, minimize conflicts among (Sosa-Rodriguez, Fabiola S., University of Waterloo)
507	20	19	54	20	2	sectors, and maximize the benefits of synergies for the integration of a climate change policy, the Interministerial Commission on Climate Change (CICC) was created in 2005" (Sosa-Rodriguez, 2013). (Sosa-Rodriguez, Fabiola S., University of Waterloo)
508	20	20	1	20	2	20.4.2. What does "external policy support" mean? Policies formulation is an act of national sovereignty, development assistance should support and act through national development goals and efforts according to the principles of the Accra Agenda and Paris Declaration. If climate change policy agendas are perceived as externally driven, owernship will be low and implementation flawed. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
509	20	20	2	20	2	Why are you suddenly speaking only about adaption here?\n\n (NETHERLANDS)
510	20	20	2	20	2	can you please describe the three mechanisms: what could be incentives, it is also unclear what kind of institutions you mean when you were just describing in the same sentence that this applies to countries where there are no institutional mechanism in place\n\n (NETHERLANDS)
511	20	20	12	20	13	It also depends largely on the extent of the challenge: for example, adaptation to extreme events or tipping points may require transformative adaptation for which even highly adaptive communities are not prepared. (Bettencourt, Sofia, World Bank)
512	20	20	16	20	16	full stop at the end of the sentence is missing\n\n (NETHERLANDS)
513	20	20	24	20	28	Assertion that traditional knowledge in many developing countries, particularly in Africa, could moderate the uncertainties of climate change and weak institutions is dubious. (UNITED STATES OF AMERICA)
514	20	20	26	20	28	By whom is the traditional knowledge not recognised? Provide explanation and reference!\n\n (NETHERLANDS)
515	20	20	30	20	33	What we understand from this sentence is that the indigenous people calibrate the forecasts of the Kenyan Meteorological Agency. This in our view does not mean that they are using the traditional knowledge of the indiginous groups but rather using them to help them in the western Scientific Approach. Therefore, concluding that the two groups are working together combining western science with indiginous knowledge is false. If they are actually using the indiginous knowledge, please make it more specific. \n\n (NETHERLANDS)
516	20	20	33	20	35	An example is offered by communities in Samoa under the Infrastructure Asset Management Program, which has been active for more than a decade and emphasizes resilience (see Implementation_20Guidelines.pdf file sent as a supporting documentation to this review) (Bettencourt, Sofia, World Bank)
517	20	20	35	35	39	However in page 9 line 18/20, there is an example where under democracy, client-list politics undermined the adaptation policies. (de Campos, Christiano, Petroleo Brasileiro SA)

#	Ch	From Page	From Line	To Page	To Line	Comment
518	20	20	41	20	41	One may wish to know where" the large flows of funds and other resources" will come from? (Dube, Pauline, University of Botswana)
519	20	20	46	21	6	This section is talking about funds and resources needed. Everything from line 46 should be moved to previous sections as it deals with aspects of institutions already described previously. \n\n (NETHERLANDS)
520	20	21	1	21	4	Citations should be provided for these statements. (Mach, Katharine, IPCC WGII TSU)
521	20	21	1	21	6	The entire paragraph misses a reference\n\n (NETHERLANDS)
522	20	21	2	21	2	River basins are not necessarily public goods, according to the definition of this term from Economics. They are not non-rival in consumption and non-excludible. (UNITED STATES OF AMERICA)
523	20	21	3	21	3	Marine refers to oceanic, not riverine life. (UNITED STATES OF AMERICA)
524	20	21	4	21	6	A good example of this is basin management, where decisions upstream (e.g. installation of dams or irrigation schemes) affect flooding patterns and water and sediment availability downstream. This is particularly challenging for basins involving international waters, such as the Nile or Zambezi river basins. (Bettencourt, Sofia, World Bank)
525	20	21	8	0	21	This paragraph seems mixed up and difficult to read. These ideas are not well combined and would need to be revised with separating concepts versus examples. (Vasseur, Liette, Brock University)
526	20	21	8	21	9	Additional reference suggested in this context: Garschagen (2013) uses the lens of institutional and organizational theory to analyse in detail how local institutional and cultural conventions specific to a given country/management sector/culture might be at odds with the (normative) propositions generally linked to the debates around resilience and climate change adaptation governance. Acknowledging these institutional gaps more thoroughly is needed since they can turn into hard barriers for the integration of resilience principles and, hence, successful adaptation. Garschagen uses a case study from Vietnam to illustrate how the resilience propositions around open and flexible management system including notions of self-regulation and bottom-up learning are in stark contrast to the current management principles applied in Vietnam which are characterised by top-down, centralistic and control-oriented rules of decision making. He suggests that resilience debates need to be more 'honest' in addressing such conflicts -- apart from the normative debate how institutions 'could' and 'should' be changed to enable more resilience. [Garschagen, M. (2013). Resilience and Organisational Institutionalism from a Cross-Cultural Perspective – An Exploration based on Urban Climate Change Adaptation in Vietnam. In: Natural Hazards, 67(1): 25-46.] (Garschagen, Matthias, United Nations University)
527	20	21	8	21	15	Jargony and redundant (UNITED STATES OF AMERICA)
528	20	21	8	21	17	Citations supporting these statements should be clarified. (Mach, Katharine, IPCC WGII TSU)
529	20	21	9	21	10	what do you mean by 'checks and balances', are you referring to money?\n\n (NETHERLANDS)
530	20	21	15	21	15	What is a "compact"? (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
531	20	21	15	21	15	The year of the reference 'Schlager et al.' is missing, should be 2011\n\n (NETHERLANDS)
532	20	21	15	21	15	what are compacts? Definitely add water compacts \n\n (NETHERLANDS)
533	20	21	15	21	15	not clear to the reader what is allocated by the rules, we guess you mean water\n\n (NETHERLANDS)
534	20	21	15	21	21	Uniform the reference (Schlager and Heikkila, 2011) (ITALY)
535	20	21	17	21	21	20.4.2. The factor capacity to change and innovate which is introduced here seems important especially for adaptation but also the implementation of climate policies in general and was developed as one of the key criteria of effective administration of public climate finance by Bird et al (2013), use reference (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)

#	Ch	From Page	From Line	To Page	To Line	Comment
536	20	21	25	21	25	causal relationship between ecological sustainability and social equity should not be viewed as a singular or unidirectional. (UNITED STATES OF AMERICA)
537	20	21	27	21	27	for easier understanding we would suggest to split the paragraph in 2\n\n (NETHERLANDS)
538	20	21	27	21	31	Current governance structures in many developing countries remain highly sectoral and do not lend themselves well to the inter-sectoral nature of climate adaptation challenges. Also, the top down rigidity of many governance structures constraints the free flow of information and knowledge to local level decision makers, who require it for transformational adaptation. An example is the rigid control over meteorological data exerted by many developing countries Meteorological services. (Bettencourt, Sofia, World Bank)
539	20	21	34	22	8	Not only innovation, also traditional knowledge and practices can enhance climate resilience. Many of these practices still need to be researched. (Sosa-Rodriguez, Fabiola S., University of Waterloo)
540	20	22	4	22	8	For enhancing choices through innovations, (20.4.3) can we give more specific examples? For example, mention of technology revolution such as the increasing use of mobile phones and how can speed transmission of information in case of early warning and risk management. Some examples: In India, contracted farmers of PepsiCo have the opportunity to manage the many risks associated with potato-growing through an index-based insurance product, which is sold through ICICI Lombard General Insurance and managed by Weather Risk Management Services. The programme is particularly innovative, as farmers receive weather data and information on how to prevent avoidable crop loss via mobile phones. As a result, information on the weather is sent in a timely and regular manner (cited in UNFCCC 2012 and taken from Hazell et al.,2010). Reference: Hazell P, Anderson J, Balzer N, Hastrup-Clemmensen A, Hess U and Rispoli F. 2010. The Potential for Scale and Sustainability in Weather Index Insurance for Agriculture and Rural Livelihoods. Available at\n< http://www.ifad.org/ruralfinance/pub/weather.pdf >; UNFCCC.2012. Approaches to address loss and damage associated with climate change impacts in developing countries that are particularly vulnerable to the adverse effects of climate change to enhance adaptive capacity. FCCC/SBI/2012/INF.14. (Yuzva, Kristina, United Nations University Institute for Environment and Human Security (UNU-EHS))
541	20	22	11	22	22	Please consider including "loss of biodiversity and ecosystems" as a major threat to natural systems that the world faces in this century. (NORWAY)
542	20	22	13	22	14	Statements says that a confluence of economic, demographic, social and cultural changes is a threat facing society. That's probably not what was meant with this sentence. Please rephrase to what you actually mean to say.\n\n (NETHERLANDS)
543	20	22	18	22	18	In the terminology of the special report, "climate extremes" and "extreme events" are synonymous--if there is an intended distinction here, it would be helpful to clarify it. (Mach, Katharine, IPCC WGII TSU)
544	20	22	19	22	22	Statement is unclear and would benefit from cutting into shorter sentences and rephrasing.\n\n (NETHERLANDS)
545	20	22	28	22	29	Please consider including "environmental changes" in this list of changes. (NORWAY)
546	20	22	28	22	30	Before referring to "these non-linear, interacting changes", please indicate which changes are meant with that (among a "wide range of stressors and threats"?).\n\n (NETHERLANDS)
547	20	22	37	22	37	Statement starts with "prevention considers". Please indicate prevention of what.\n\n (NETHERLANDS)
548	20	22	39	22	39	Statement starts with "It is". Please indicate what is meant with "It".\n\n (NETHERLANDS)
549	20	22	42	22	42	Statement starts with "In the absence of prevention". Please indicate prevention of what.\n\n (NETHERLANDS)
550	20	22	44	22	44	Please find academic references instead of grey literature (i.e. Delta Commission, 2008) for examples of flood risk management.\n\n (NETHERLANDS)
551	20	22	44	22	44	Give examples of the new ways of accommodating water in landscapes. (UNITED STATES OF AMERICA)

#	Ch	From Page	From Line	To Page	To Line	Comment
552	20	22	45	22	45	Please find academic references instead of grey literature (i.e. Environmental Agency, 2009) for examples of flood risk management.\n\n (NETHERLANDS)
553	20	22	45	22	54	Put this definition - of incremental and transformational adaptation - up front, after paragraphs on line 19-25 of page 5. (Bettencourt, Sofia, World Bank)
554	20	22	46	22	46	The part of the sentence after the colon should start with a small letter, not with a capital, i.e. "incremental" instead of "Incremental".\n\n (NETHERLANDS)
555	20	22	46	22	49	Incremental adaptation (as opposed to transformational adaptation) is defined for first time here although "Incremental changes"; "incremental approaches" and "incremental adaptation" are used starting from the executive summary. Define the concept earlier in the chapter. (Dube, Pauline, University of Botswana)
556	20	22	54	23	3	Statement is unclear and would benefit from cutting into shorter sentences and rephrasing.\n\n (NETHERLANDS)
557	20	22	54	23	3	As commented on pages 12 and 16, it would be useful to provide a clearer sense that there is a timeframe over which impacts are largely a result of past emissions and inertias in climate and socioeconomic systems (and thus impacts can mainly be reduced through adaptation in the shorter-term) and a longer-term timeframe over which impacts are largely a result of the decisions we make now and going forward (in which impacts can be reduced through mitigation starting in the shorter-term and adaptation in the longer-term). (Mastrandrea, Michael, IPCC WGII TSU)
558	20	23	1	23	1	What is meant by "climate change is going to be significant enough" should be clarified. That is, it would be helpful to distinguish between locked in climate change in the next few decades and levels of climate change later in the century where choices about mitigation are important. Please see my overall comment on "characterization of future risks" and the framing of the eras of climate responsibility and climate options. (Mach, Katharine, IPCC WGII TSU)
559	20	23	8	23	19	Could benefit from further description of which aspects of future climate change are expected to be non-linear. Seems quite a definitive statement. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
560	20	23	8	23	19	It's not clear why this paragraph is here. Suggest deleting. (UNITED STATES OF AMERICA)
561	20	23	8	23	19	It seems to me that this part is already addressed in other, more focused, chapters. Is it really necessary? (ITALY)
562	20	23	8	23	29	A good point on climate change threat to sustainability and need for societal transformation to maintain resilience (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
563	20	23	14	23	16	Statement is unclear and would benefit from rephrasing. Note: aren't future impacts of climate change expected to be non-linear anyhow?\n\n (NETHERLANDS)
564	20	23	14	23	16	Non-linear impacts are possible even with ambitious mitigation efforts (if less likely). (Mastrandrea, Michael, IPCC WGII TSU)
565	20	23	15	23	15	It would be preferable to make this statement more nuanced. Non-linear changes can take a variety of forms across systems and can be relevant to a variety of levels of climate change, with differing probabilities (associated with varying uncertainties and ambiguities). (Mach, Katharine, IPCC WGII TSU)
566	20	23	21	23	21	Statement refers to "such scenarios". Please indicate which scenarios are meant.\n\n (NETHERLANDS)
567	20	23	21	23	21	Suggest including a cross reference for other sections in WG2 where "tipping points" are discussed. (UNITED STATES OF AMERICA)
568	20	23	21	23	21	It would be helpful to clarify further what is meant by "such" scenarios. (Mach, Katharine, IPCC WGII TSU)
569	20	23	22	23	25	Statement is unclear and would benefit from cutting into shorter sentences and rephrasing.\n\n (NETHERLANDS)

#	Ch	From Page	From Line	To Page	To Line	Comment
570	20	23	22	23	25	Statement says "that collapses can be avoided by through collective strategies". Please be more specific. Probably, statement means to say: there have been some historical examples where collective strategies have contributed to socio-ecological resilience.\n\n(NETHERLANDS)
571	20	23	26	23	29	Statement is unclear and would benefit from cutting into shorter sentences and rephrasing.\n\n(NETHERLANDS)
572	20	23	37	23	37	Please find academic references instead of grey literature (i.e. WBGU, 2011) for examples of "increasing calls for deliberate transformations".\n\n(NETHERLANDS)
573	20	23	41	23	41	Statement is unclear and would benefit from cutting into shorter sentences and rephrasing.\n\n(NETHERLANDS)
574	20	23	46	24	5	This paragraph does not discuss barriers to transformation - e.g. people may not want to change as they like the status quo; having to change may be difficult for cultural or other reasons (perceived change in lifestyle?). (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
575	20	23	48	23	48	Statement uses "but". What or where is the contradiction exactly? Can't transformations be triggered by events and be long-term processes? \n\n(NETHERLANDS)
576	20	23	49	23	54	Other enabling factors for transformation include free flow of external knowledge and transformation to decision makers; presence and support to innovative champions; and peer-to-peer learning, such as the effective transfer of south-south learning from the Madagascar cyclone building norms to the safe schools program in Mozambique (Bettencourt, Sofia, World Bank)
577	20	24	7	24	8	Discussion in the literature also includes warnings and concerns about deliberately created transformations. E.g.: Meadowcroft, M., 2009, What about the politics? Sustainable development, transition management, and long-term energy transitions. Policy Sciences, vol. 42, iss. 4, pp 323-340. E.g.: Smith, A. and Stirling, A., 2010, The politics of social-ecological resilience and sustainable socio-technical transitions. Ecology & Society, vol. 15, iss. 1, art. 11. E.g.: Voss, J.-P., Bornemann, B., 2011, The politics of reflexive governance: challenges for designing adaptive management and transition management. Ecology & Society, vol. 16, iss. 2, art. 9.\n\n(NETHERLANDS)
578	20	24	7	24	27	Authors may wish to coordinate this discussion with response option discussion in chapter 14. (Chatterjee, Monalisa, IPCC WGII TSU)
579	20	24	13	24	14	20.5.2. Is that so that the lines between transformational change and business as usual are blurred? Isn't it about decoupling emissions from growth at the end of the day? The role of this report should be to clear the fog in this question and be more outspoken (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
580	20	24	37	24	38	This definition of climate resilient pathways is not mentioned before in the chapter. Earlier in the chapter it is not clear if climate resilient pathways is part of sustainable development. (Chatterjee, Monalisa, IPCC WGII TSU)
581	20	24	38	24	39	Statement is very unclear and would benefit from rephrasing. What is meant with "multiple paths leading to the same amount of climate resilience"? Why are that "alternative stable states"? Is resilience quantifiable? There is quite a constellation of assumptions and short-cuts behind this statement.\n\n(NETHERLANDS)
582	20	24	39	24	39	Similar to previous comment, statement suggests a way of interpreting empirical settings and dynamics. For example, thinking in terms of "the total amount of resilience within the entire system remains unchanged". Maybe you can explain what you mean to say in another way.\n\n(NETHERLANDS)
583	20	24	39	24	39	Are these necessarily stable states given the characterization of climate-resilient pathways as evolutionary processes? Path dependence might be useful to mention here as an alternative. (Mastrandrea, Michael, IPCC WGII TSU)
584	20	24	47	24	51	Without references, this paragraph consists out of normative, random statements. Please underpin statements with references.\n\n(NETHERLANDS)
585	20	24	47	24	51	Citations could be provided here for the statements made. (Mach, Katharine, IPCC WGII TSU)

#	Ch	From Page	From Line	To Page	To Line	Comment
586	20	24	49	24	51	Statement is very unclear and would benefit from cutting into shorter sentences and rephrasing.\n\n (NETHERLANDS)
587	20	25	1	25	54	Perhaps, some examples of climate-resilient pathways, their characteristics, advances, and limits could further clarify this idea/concept. (Sosa-Rodriguez, Fabiola S., University of Waterloo)
588	20	25	5	25	6	Without references, this statement becomes normative. Please underpin with references.\n\n (NETHERLANDS)
589	20	25	10	25	14	Statement needs rehrasing, particularly syntax. I.e., would a business-as-usual future society almost certainly result in losses?\n\n (NETHERLANDS)
590	20	25	17	25	17	Statement starts with "within these boundaries", please indicate which boundaries. (I.e. of the 'envelope of climate resilience')\n\n (NETHERLANDS)
591	20	25	22	25	25	This paragraph should make reference to the examples that are inferred. The use of the semi colon after "vulnerabilities" confuses the entire meaning of the paragraph. (Viner, David, Private)
592	20	25	26	25	26	Statements includes "as one aspect of sustainable development". To what does "as one aspect" refer to?\n\n (NETHERLANDS)
593	20	25	26	25	31	It will help (since this is not done on the figure 20-3 either) to explain more the kind of situation that my result in Path 1 - low challenges as e.g. opposed to Path 3 - with substantial challenges. (Dube, Pauline, University of Botswana)
594	20	25	28	25	28	It would be preferable to avoid use of "likely" here, as it is a reserved likelihood term. (Mach, Katharine, IPCC WGII TSU)
595	20	25	28	25	28	I suggest using a different descriptor here, as this does not appear to be a formal use of "likely." (Mastrandrea, Michael, IPCC WGII TSU)
596	20	25	38	25	38	Statement begins with "In principle". Is "in principle" what is meant? Or rather "overall"? \n\n (NETHERLANDS)
597	20	25	38	25	54	Compliments! Nice that this paragraph gives some overview and insights into the discussion.\n\n (NETHERLANDS)
598	20	25	38	25	54	This is good, clear language and authors should consider moving it forward to serve as introductory material for the chapter. (UNITED STATES OF AMERICA)
599	20	25	43	25	45	This statement asserts that scientists do not agree on the two levels of climate change described here, but this implies that it is reasonable to expect agreement among scientists on these levels, which is not really accurate. Such judgments (e.g., what constitutes achieving climate resilience, what constitutes enormous effort, what constitutes severe impacts) are based on values, levels of acceptable risks, etc., and are not purely scientific questions. I would suggest refining the description here to make this clearer. One way to do this would be to broaden this statement about scientists to include decisionmakers and stakeholders as in line 39 above. (Mastrandrea, Michael, IPCC WGII TSU)
600	20	25	46	25	48	A specific location in AR4 for this statement is needed, rather than a reference to the entire report. Further description of what this judgment is based on would also be useful. (Mastrandrea, Michael, IPCC WGII TSU)
601	20	25	52	25	54	20.6.1. An important conclusion which should be quoted in the intro and taken up in the Technical Summary and Summary for Policy Makers (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
602	20	26	3	0	0	Section 20.6.2. This ending for 20.6 is not as strong as it could be. Currently, it is quite repetitive and does not substantially add insight to the assessment that has preceded it. (Mach, Katharine, IPCC WGII TSU)
603	20	26	3	0	0	Section 20.6.2: This is one of the places where the section covers ground largely already covered, as mentioned in my general comments. (Mastrandrea, Michael, IPCC WGII TSU)
604	20	26	7	26	11	20.6.2. Stress that decoupling emissions from development is a no regret strategy since it accomplishes both sustainable development and mitigation of dangerous cliamte change. The language could be more explicit here. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)

#	Ch	From Page	From Line	To Page	To Line	Comment
605	20	26	15	26	15	The phrase "solution space" is used in the special report, but not quite in this context. Alternative wording could be preferable here. (Mach, Katharine, IPCC WGII TSU)
606	20	26	17	26	30	This material is quite repetitive with earlier sections, and it would be preferable to reduce overlap and increase the value that is added here. (Mach, Katharine, IPCC WGII TSU)
607	20	26	20	26	20	Casual usage of "likely" should be avoided as it is a reserved likelihood term. (Mach, Katharine, IPCC WGII TSU)
608	20	26	22	26	22	It will be useful to provide an example/s where such failures are being experienced and a reference (Dube, Pauline, University of Botswana)
609	20	26	22	26	25	The paragraph needs revision: jump from adaptation strategies that erode sustainable development to loss and damage (but no sentence to tie the two thoughts together). (Yuzva, Kristina, United Nations University Institute for Environment and Human Security (UNU-EHS))
610	20	26	23	26	23	Dot at the end of the sentence is missing.\n\n (NETHERLANDS)
611	20	26	24	26	24	Perhaps add the word "already" between "are" and "impeding" to improve clarity. (Dube, Pauline, University of Botswana)
612	20	26	27	26	30	Is it different from the concept incremental vs transformation at p. 22? It may create confusion on non expert reader. Please, clarify (ITALY)
613	20	26	28	26	30	For the definition of transformation provided, it would be preferable to quote the definition in the glossary of this report. (Mach, Katharine, IPCC WGII TSU)
614	20	26	31	26	31	Casual usage of "likely" should be avoided as it is a reserved likelihood term. (Mach, Katharine, IPCC WGII TSU)
615	20	26	31	26	31	I suggest using a different descriptor here, as this does not appear to be a formal use of "likely." (Mastrandrea, Michael, IPCC WGII TSU)
616	20	26	36	26	36	Dot after the "7" is not necessary.\n\n (NETHERLANDS)
617	20	26	36	28	2	This section (20.7) highlights how little is actually known about climate resilient future and transformations to it. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
618	20	26	39	26	40	Delete this didactic sentence (UNITED STATES OF AMERICA)
619	20	26	52	26	54	Statement is unclear and would benefit from cutting into shorter sentences and rephrasing.\n\n (NETHERLANDS)
620	20	26	53	26	54	Issues involving additionality and criteria for access to financial support for projects seem inappropriate to appear as the number one research need from this chapter. Other research needs under "Further research needs" (page 27) appear much more appropriate and as a more logical take-away from this chapter. (UNITED STATES OF AMERICA)
621	20	26	54	27	4	Statement is unclear and would benefit from cutting into shorter sentences and rephrasing.\n\n (NETHERLANDS)
622	20	27	9	27	9	climate change extremes and "extreme events" could be considered synonyms. If a distinction is intended here, it would be preferable to clarify it. (Mach, Katharine, IPCC WGII TSU)
623	20	27	11	27	11	Statement begins with "what might the options be". Please indicate the options for what? \n\n (NETHERLANDS)
624	20	27	11	27	11	Statement says "how can they be facilitated". Please indicate who "they" are. Or do you mean "these options for...."? \n\n (NETHERLANDS)
625	20	27	11	27	12	Statement says "how can they be facilitated where they should be considered". Do you mean "how can they be facilitated, and where they should be considered"? \n\n (NETHERLANDS)
626	20	27	14	27	41	Another important topic of research gap is how to establish and maintain an adaptive process, capable of learning by doing and adjusting based on continuous feedback. (Bettencourt, Sofia, World Bank)

#	Ch	From Page	From Line	To Page	To Line	Comment
627	20	27	22	27	23	Participation, equity and accountability are also considered as input of sustainable development, not as outcomes. E.g. : Jordan, A., 2008, The governance of sustainable development: taking stock and looking forwards. Environment and Planning C: Government and Policy, vol. 26, iss. 1, pp 17 – 33. And e.g.: Biermann, F., Abbott, K., Andresen, S., Bäckstrand, K., Bernstein, S., Betsill, M.M., Bulkeley, H., Cashore, B., Clapp, J., Folke, C., Gupta, A., Gupta, J., Haas, P.M., Jordan, A., Kanie, N., Kluvánková-Oravská, T., Lebel, L., Liverman, D., Meadowcroft, J., Mitchell, R.B., Newell, P., Oberthür, S., Olsson, L., Pattberg, P., Sánchez-Rodríguez, R., Schroeder, H., Underdal, A., Camargo Vieira, S., Vogel, C., Young, O.R., Brock, A., Zondervan, R., 2012, Navigating the anthropocene: improving earth system governance. Science, vol. 335, iss. 6074, pp 1306-1307.\n\n (NETHERLANDS)
628	20	27	34	27	34	contests should probably be "contexts".\n\n (NETHERLANDS)
629	20	27	43	27	44	It would be preferable to distinguish between climate change that is locked in the next few decades (with its corresponding impacts) and levels of climate change later in the 21st century where mitigation choices and emissions trajectories will determine the amount of climate change realized (with corresponding impacts). My overall comment on the chapter on "characterization of future risks" could be considered here. (Mach, Katharine, IPCC WGII TSU)
630	20	27	43	27	50	Highlights need for further research into geoengineering and structures for global policymaking. This does not appear to be carried through to the TS or SPM. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
631	20	27	45	27	50	Aren't responsibility, risks, and unwanted outcomes also part of the discussion on geo-engineering?\n\n (NETHERLANDS)
632	20	27	46	0	0	DELETE: "solutions" Comment: The danger, of course, is that there could be a rush toward risky geoengineering techniques that turn out NOT to be solutions. (Mooney, Pat Roy, Action Group on Erosion, Technology and Concentration (ETC Group))
633	20	27	48	0	0	geo-engineering' should be spelt 'geoengineering' to be consistent with the rest of the report. (Vivian, Chris, IMAREST)
634	20	27	48	0	50	While we agree that if geoengineering is being considered by governments, deployment cannot be contemplated without considering costs, benefits, a wide range of possible impacts, and fair and equitable structures for global policymaking and decision-making, etc. But ETC Group, and others, have argued that geoengineering simply should not be contemplated. See ETC Group, "Darken the sky and whiten the earth: The dangers of geoengineering," _Development Dialogue_ no. 61, September 2012, pp. 210-237; Pierrehumbert, Raymond. 2013. "Cumulative Carbon and Just Allocation of the Global Carbon Commons," _Chicago Journal of International Law_, January 1, 2013; Hamilton, Clive (2013). _Earthmasters: The Dawn of the Age of Climate Engineering._ Yale University Press. 2013. On fair and equitable structures for global policymaking, see Gardiner, Stephen M. (2013). Why geoengineering is not a 'global public good', and why it is ethically misleading to frame it as one. _Climatic Change_. DOI 10.1007/s10584-013-0764-x. (Mooney, Pat Roy, Action Group on Erosion, Technology and Concentration (ETC Group))
635	20	27	48	27	49	Please also add r i s k s to "costs, benefits, a wide range of possible impacts". (GERMANY)
636	20	27	50	27	50	Because of the wide range of impacts research should consider the perspective from various disciplines (e.g. ethics, political science, ...). This consequence should be additionally mentioned (GERMANY)
637	20	28	0	28	0	the order of FAQs 20.1 and 20.2 may be changed (Goheer, Arif, Global Change Impact Studies Centre (GCISC))
638	20	28	7	28	11	FAQ 20-1 Is climate resilient pathways a process and sustainable development an outcome? Are there other pathways to sustainable development? Perhaps an FAQ could clarify these questions for a wider audience. (Chatterjee, Monalisa, IPCC WGII TSU)
639	20	28	13	28	17	What is now FAQ 20.2 should precede FAQ 20.1. (UNITED STATES OF AMERICA)
640	20	28	13	28	17	FAQ 20-2 This FAQ can be combined with FAQ 1. (Chatterjee, Monalisa, IPCC WGII TSU)
641	20	28	19	28	25	FAQ 20.3 is weak. (UNITED STATES OF AMERICA)

#	Ch	From Page	From Line	To Page	To Line	Comment
642	20	28	22	28	22	The word "development" may be repalced with "developmental" (Goheer, Arif, Global Change Impact Studies Centre (GCISC))
643	20	31	23	31	23	Fleming, J.R. 2010: Fixing the Sky: The checkered history of weather and climate control. Columbia University Press, New York. (Fleming, James Rodger, Colby College)
644	20	32	32	32	32	House, K.Z., A.C. Baclig, M. Ranjan, E.A. van Niefop, J. Wilcox, H.J. Herzog 2011: Economic and energetic analysis of capturing CO2 from ambient air, PNAS, www.pnas.org/cgi/doi/10.1073/pnas.1012253108 (Fleming, James Rodger, Colby College)
645	20	37	42	37	42	Geological Disposal of Carbon Dioxide and Radioactive Waste: A Comparative Assessment 2011, F.L. Toth, ed., Advances in Global Change Research 44. (Fleming, James Rodger, Colby College)
646	20	40	0	40	0	I cannot understand the necessity of Table 20-2(20-1). For example, why does the table only show the limited countries? In addition, the Japanese government has already declared to revise her target soon. There are less relationships between the context of the text and this table. The table should be deleted. (Akimoto, Keigo, Research Institute of Innovative Technology for the Earth (RITE))
647	20	41	0	0	0	In the title of Figure20-1, "Northern Tibet" should be changed to "Northern Tibet, China". (CHINA)
648	20	41	0	0	0	Figure20-2 is not clear. It is suggested to further improve the figure to make it easier and straightforward. (CHINA)
649	20	41	0	0	0	Figure20-3 shows a qualitative concept. It is suggested to further improve the figure to make it easier and straightforward. (CHINA)
650	20	41	0	0	0	Figure 20-2: This figure does not match the text, which says that there are "interacting spheres." Rather the figure depicts overlapping spheres. Is the "practical" within the "political," within the "personal"? Perhaps it should be more like a Venn diagram (with areas of overlap) or like three circles with arrows to show interactions? (UNITED STATES OF AMERICA)
651	20	41	0	0	0	Figure 20-2: It is not entirely clear what this figure is trying to illustrate. The figure caption is inadequate. What are the shaded areas representing for instance? The author team should include a sentence in the figure caption explaining the main message of this figure. (Estrada, Yuka, IPCC WGII TSU)
652	20	41	0	0	0	Figure 20-2: This figure provides very useful information. I assume the authors are already considering ways to refine the visual presentation of this figure, and I would encourage such efforts. I would also encourage the development of a caption that explains its features, including the spheres and shaded wedges. (Mastrandrea, Michael, IPCC WGII TSU)
653	20	41	0	41	0	What is the source of Figure 20.1 (Goheer, Arif, Global Change Impact Studies Centre (GCISC))