The overall chapter: As a reviewer who has also read ch. 1 and ch. 4, it was difficult for me to see how this chapter is distinct from the other two, and especially from ch. 4, because that part of the information from ch. 4 repeats in ch. 5. There is a lot of heterogeneous information in the chapter that is condensed and very brief. The chapter struggles with an overall narrative or even topic, despite the title, which seems to want to provide focus. However, the content does not seem to be meaningfully arranged according to the title. It is unclear whether this chapter is a summary chapter or whether it provides more specific information about things mentioned already in chapter 5. It is not necessarily clear why this is a chapter that should stand on its own. Some rearranging of chapter content may be in order. [Marion Grau, Norway]

Taken into account. We have made efforts to streamline this Ch.5 narrative and to more clearly delineate it from previous chapters.

Wang Xiaojun et al. [Sharma Sudhir, Welti-Chanes, Gao Juan, He Ruimin] Adaptation to climate change impacts on water demand: Mitigation and Adaptation Strategies for Global Change [2016] 17(11): 81-89 [Xiaojun Wang, China]

Thank you - we have added this reference.

Chapter 5 could be shorter if it focuses on climate change impacts, SD, and the synergies and trade-offs between them, moving the impacts of 1.5°C, descriptions of SD and SGD in Chapter 3 or 4. Chapter 4 already explains SD and SGD in 4.4.2 (p. 4-45) and implementing SD and SGD in 4.5.4 (p.4-81). Convergence with sustainable development, etc. Please remove overlapping. [Akiko Kanuma, Japan]

Chapter 5 could be shorter if it focuses on climate change impacts, SD, and the synergies and trade-offs between them, moving the impacts of 1.5°C, descriptions of SD and SGD in Chapter 3 or 4. Chapter 4 already explains SD and SGD in 4.4.2 (p. 4-45) and implementing SD and SGD in 4.5.4 (p.4-81). Convergence with sustainable development, etc. Please remove overlapping. [Akiko Kanuma, Japan]

Taken into account. We have made efforts to streamline this Ch.5 narrative and to more clearly delineate it from previous chapters.

Related to the above point, there is a surprising link in the chapter on civil unrest, civil strife, civil war, climate migration, etc that results from worsening climate conditions - especially for the more vulnerable. For instance, some of the work of Thomas Homer-Dixon would seem relevant. E.g., Homer-Dixon, T. F., 2010. Environment, scarcity, and violence. Princeton University Press.


Agreed. We have flagged this concern with the section lead for ch.5 and revised accordingly. More needs to be done for the final-draft to avoid such territorial encroachment.

The Agenda 2030 is now explained in more depth and arguments from the literature on past 2030 reflected (see sp.1, sp.6.2 and FA22)

Agreed. We have flagged this concern with the section lead for ch.5 and revised accordingly. More needs to be done for the final-draft to avoid such territorial encroachment.

Across the whole chapter: I am surprised that more is not made of the growing state of informality (both work and living conditions) in developing country cities. Informal national governments are important for being particularly vulnerable to climate change, beyond the reach of formal climate policies and also as spaces of innovation and improvisation from which some adaptation (and mitigation) programmes can learn. I would argue that this is an important omission from the current references to cities. In Africa 62% of urban live under conditions of informality - it is the lived reality of the majority urban people on the continent and not some passing phase. See Gordon & McGranahan (2016) and Sylvia Jaglin's (2014) work on this, as well as Parnell and Pieterse (2012). [Anton Carstenger, South Africa]

Informality is addressed in cross-chapter box 5.1. on Cities and Urban Transformation (case study: Addis Ababa)

The chapter now includes much more literature on equity, including both normative and empirical approaches. We focus on literature from 2014 onwards, in the context of sustainable and climate-resistant development pathways. More literature is emerging now and we will include it in the final draft in may.

A general comment: this chapter (and others) emphasize the importance of 'equity' in various places. In terms of this report, the principle of equity can be seen as a moral obligation, a question of climate responsibility, and for evaluating empirical outcomes. (Relatively, in-discussing equity, references are made to various UN sustainable development documents.)

One thing that is not explored is that there is a theoretical and empirical literature on the empirical consequences of equity (or lack of equity). For example, there is literature on this in social psychology. There is also a literature on this in social movements and collective action. For example, Bert Uweem reviews some of this literature: Uweem, B., 1996. 'Ethnolocalisation of collective action.' Annual Review of Sociology, 24(1), pp.215-238.


Thank you - we have added this reference.

Chapter 5 could be shorter if it focuses on climate change impacts, SD, and the synergies and trade-offs between them, moving the impacts of 1.5°C, descriptions of SD and SGD in Chapter 3 or 4. Chapter 4 already explains SD and SGD in 4.4.2 (p. 4-45) and implementing SD and SGD in 4.5.4 (p.4-81). Convergence with sustainable development, etc. Please remove overlapping. [Akiko Kanuma, Japan]

We have updated our assessment in light of recently available literature examining 1.5°C impacts. We will continue to update our assessment as literature becomes available. It is beyond our mandate to examine past impacts of 1.5°C warming.

General comment: there is surprisingly little in the chapter on civil unrest, civil strife, civil war, climate migration, etc that results from worsening processes). [Tindall David, Canada]

Related to the above point, there is a surprising link in the chapter on civil unrest, civil strife, civil war, climate migration, etc that results from worsening climate conditions - especially for the more vulnerable. For instance, some of the work of Thomas Homer-Dixon would seem relevant. E.g., Homer-Dixon, T. F., 2010. Environment, scarcity, and violence. Princeton University Press.


Thank you - we have added this reference.

Chapter 5 could be shorter if it focuses on climate change impacts, SD, and the synergies and trade-offs between them, moving the impacts of 1.5°C, descriptions of SD and SGD in Chapter 3 or 4. Chapter 4 already explains SD and SGD in 4.4.2 (p. 4-45) and implementing SD and SGD in 4.5.4 (p.4-81). Convergence with sustainable development, etc. Please remove overlapping. [Akiko Kanuma, Japan]

Taken into account. We have made efforts to streamline this Ch.5 narrative and to more clearly delineate it from previous chapters.

General comment on the whole chapter: this chapter seems to veer into Chapter 4 territory with discussions linked to means and approaches to implementation. For example on pg. 15 EBA with mangrove restoration has reduced coastal vulnerability while protecting marine and terrestrial ecosystems; river basin EBA has reduced flood risk and improved water quality; and wetland and mangrove restoration has increased local food security (Chen 2014: Munasinghe et al. 2013a). EBA may be no more cost effective than other, can be inclusive of local knowledge, and more easily accessed by the poor (Estrella et al. 2016; Olof 2015; Dargavel et al. 2015). The AIP noted biodiversity, hazard reduction, and water protection co-benefits as well as economic benefits such as ecotourism through improving ecosystem services. Because ecosystems themselves are sensitive to temperatures and sea level, a 1.5°C global temperature compared to 2°C or higher, is likely to enhance the success and reduce the costs of EBA. This sort of content overlap will need to be minimised to ensure that the policy relevance of Chapters 4 and 5 are clear and distinct for policy makers and practitioners. The SD-relevance of all information presented in Chapter 5 must be clear. [Ikuya Roberts, South Africa]

The chapter now includes much more literature on equity, including both normative and empirical approaches. We focus on literature from 2014 onwards, in the context of sustainable and climate-resistant development pathways. More literature is emerging now and we will include it in the final draft in may.

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<table>
<thead>
<tr>
<th>Comment No</th>
<th>From Page</th>
<th>From Line</th>
<th>To Page</th>
<th>To Line</th>
<th>Comment</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>12094</td>
<td>25</td>
<td>200</td>
<td>25</td>
<td>204</td>
<td>General comment: Surprisingly, there is no real discussion of population control as part of the mix of mitigation efforts. [Tindall David, Canada]</td>
<td>Literature addresses the issue through demand reduction and it is there in the chapter.</td>
</tr>
<tr>
<td>12095</td>
<td>25</td>
<td>203</td>
<td>25</td>
<td>206</td>
<td>General comment: There are some good discussions of tradeoffs involved in different decarbonisation strategies (e.g. trade-offs for biofuels versus food production). Perhaps a list of known trade-offs could be provided somewhere. Of the figures in Chapter One attempts an initial try at this. This task could be explored more fully in Chapter Five. [Tindall David, Canada]</td>
<td>Comprehensive assessment of adaptation and mitigation response options and their interdependences with SDGs (synergies and trade-offs) is presented in sections 5.3 and 5.4 respectively. Updated graphics are introduced where appropriate (see figs 5.3, 5.4 and table 5.1). Graphics will continue to be updated for the final governmental draft.</td>
</tr>
<tr>
<td>17215</td>
<td>26</td>
<td>110</td>
<td>26</td>
<td>115</td>
<td>Chapter 5 should include a map of loss and damages of climate change, including extreme weather events for the future 1.5 and 2 degrees scenarios [Carlos Garcia Soto, Spain]</td>
<td>This is outside of the scope of this chapter. However, CH5 covers impacts of extreme weather events and limits to adaptation, and bio.</td>
</tr>
<tr>
<td>12096</td>
<td>26</td>
<td>125</td>
<td>26</td>
<td>130</td>
<td>Table 5.1: I wonder if Table 5.1 might be formatted differently for reviewers. For example, if it was in Excel with frozen panes, the reviewer could review it but still see the column and row headers. [Tindall David, Canada]</td>
<td>Done. See appendix 1.</td>
</tr>
<tr>
<td>19777</td>
<td>26</td>
<td>198</td>
<td>26</td>
<td>199</td>
<td>Human Rights and Business Resource Centre: <a href="https://humanrights.ca/resources/studies-renewable-energy">https://humanrights.ca/resources/studies-renewable-energy</a> [Tara Shine, Ireland]</td>
<td>Thank you! We have incorporated suggested literature where appropriate and in alignment with the chapter page limit.</td>
</tr>
<tr>
<td>12091</td>
<td>26</td>
<td>206</td>
<td>26</td>
<td>210</td>
<td>General comment: There does not seem to be anything in this chapter on communication and improving the public’s understanding of these issues, the latter of which is assuming an important condition for climate action to be successful. There is a significant literature on this topic. For example, some relevant materials would include:</td>
<td>Section 5.5 covers social learning and inclusive governance, with a required focus on literature from 2014 onwards. CH4 is tasked with assessing literature on implementation, incl. communication, which is beyond the scope of this chapter.</td>
</tr>
<tr>
<td>1852</td>
<td>27</td>
<td>109</td>
<td>27</td>
<td>115</td>
<td>Structure: it would seem more logical the following thematic order after the “scoping” chapter (5.1): 5.2: Impact of 1.5°C Warming on Implementation of the Sustainable Development Agenda (as the present 5.2 but with a more general title and the sub-regional/national section (now 5.2.1) would follow the more general risk/impact sections (5.2.2, 5.2.3, 5.3). Sustainable Development and Mitigation. It would begin with the “Sustainable Development Pathway Implications for Reductions of Greenhouse Gas Emissions” followed by “Impacts of Sustainable Development” 5.4. Sustainable Development and Adaptation. It would begin with the “Sustainable Development Pathway: Implications for Climate Vulnerabilities and Adaptive Capacities” followed by “Impacts of Adaptation on Sustainable Development” 5.5: Sustainable Development and Climate Action: the Integrated Approach. This section would include the present 5.6 and 5.7 because both deal with various aspects of the synergic pathways incorporating climate adaptation, mitigation and (other) dimensions of sustainable development (conditions, governance 5.6. Synthesis and Research Gaps [Tibor Farago, Hungary])</td>
<td>Yes, this is a good suggestion. We have deleted section 5.5 into 5.3 and 5.4. Original order has been retained - adaptation first, then mitigation.</td>
</tr>
<tr>
<td>1853</td>
<td>27</td>
<td>110</td>
<td>27</td>
<td>113</td>
<td>Coherence with Chapter 2: The assessments provided in Chapter 2 are not adequately taken into account, especially those which indicate need for future global emissions reductions already by 2020 (otherwise the modest emissions reductions and 2030 imply subsequent reductions and transformations that are too steep and too abrupt to be achieved by the mitigation options in the models). Therefore, it would be essential to devote more attention in Ch 5 to the social, poverty, ethical, equity, etc. aspects of the deep mitigation pathways, such features of the COP21 (in shorter term by 2030) and on longer term (by 2050, 2100) in the with the 1.5°C target. Such integrated assessments (adaptation, mitigation, sustainable development incl. SDGs) would be especially significant for a balanced approach by 2030. [Tibor Farago, Hungary]</td>
<td>Agreed. The chapter now includes a more in-depth assessment of the literature re equity and ethics aspects of mitigation pathways (see 5.3, 5.6.2 and FAQ2).</td>
</tr>
<tr>
<td>2998</td>
<td>27</td>
<td>262</td>
<td>27</td>
<td>265</td>
<td>Literature assessment must be limited to examination of 1.5°C warming, not warming in general. [Alice Aparo, United States of America]</td>
<td>We use literature specific to 1.5°C warming wherever available but, in agreement with the co-chairs, draw upon other, non-1.5°C specific literature when needed. The literature on 1.5°C and sustainable development and poverty reduction is an emerging area.</td>
</tr>
<tr>
<td>11090</td>
<td>27</td>
<td>264</td>
<td>27</td>
<td>268</td>
<td>Chapter 5 of the report struck me as poorly written and sometimes incoherent. If this were an article for a peer review journal I would most likely suggest major revisions. In particular, I would recommend the revision of this section and a thorough re-read of the chapter to ensure all the content is there (e.g. too little on food and water scarcity). [Davide Nalini, United Kingdom (of Great Britain and Northern Ireland)]</td>
<td>Noted. We have updated our systematic assessment of the literature, addressed overlaps with previous chapters, and revised the chapter structure in response to review comments and emerging literature.</td>
</tr>
<tr>
<td>12652</td>
<td>27</td>
<td>265</td>
<td>27</td>
<td>269</td>
<td>In general, much of what is said is applicable regardless of the temperature change. While the discussion about adaptation pathways, for example, is extremely important, it should be related to the 1.5°C max. or at least there needs to be a reflection on how the temperature change matters to the discussion. [Lisa Schipper, Vietnam]</td>
<td>Noted. The assessment has been made more specific to 1.5°C in light of newly available literature.</td>
</tr>
<tr>
<td>1410</td>
<td>27</td>
<td>268</td>
<td>27</td>
<td>272</td>
<td>Thought Chapter 5 did a good job (particularly the focus on mitigation and adaptation, and I feel like this could be readily folded into a more thorough treatment of SRM). Namely, one of the main points that I always make about SRM is that it’s not a permanent solution to climate change. The permanent solution is to stop putting CO2 in the atmosphere. And what that permanent solution looks like is exactly what I think Chapter 5 does quite well. [Ben Kravitz, United States of America]</td>
<td>Thank you.</td>
</tr>
<tr>
<td>9987</td>
<td>27</td>
<td>274</td>
<td>27</td>
<td>278</td>
<td>and here are some references regarding inequity: Boscarino, J., Hoffman, S., Adame, R., Figueroa, C., &amp; Siddiqui, R. (2014). Mental health outcomes among vulnerable residents after Hurricane Sandy. American Journal of Disaster Medicine, 9, 107-120. [Susan Clayton, United States of America]</td>
<td>These references refer to past impacts. CH5 addresses risks (future impacts) while CH3 covers both impacts and risks, including health.</td>
</tr>
<tr>
<td>20542</td>
<td>27</td>
<td>286</td>
<td>27</td>
<td>290</td>
<td>wondering whether the conceptual figures provided can be specified for different climate futures. [Tara Shine, Ireland]</td>
<td>We have improved all figures, incl. a new version of Fig 5.1 (now Fig 5.5) with different climate futures included.</td>
</tr>
</tbody>
</table>
A rapid carbon phase-out (consistent with a 1.5 pathway) is possible. Without mitigation efforts on this scale it will not be possible to prevent climate impacts from seriously undermining human rights, whereas a carbon phase-out can proceed in a way that protects human rights. Importantly, the challenge of climate change highlights our interdependence in the face of this true global common problem, and the need for a vision of climate justice and global solidarity that can support a real transition toward sustainability while enabling the progressive realisation of human rights, though still necessarily preliminary, our research supports the following five main conclusions:

- There is strong evidence that a rapid and total or nearly-total carbon phase-out will be technically feasible, both for developed and developing countries.
- Economic analyses suggest that a rapid carbon phase-out can be achieved at an aggregate global cost that is affordable, and much less than the potential costs of climate impacts.
- Nonetheless, a rapid carbon phase-out will be very demanding for all countries, especially developing countries, and presents potential risks to human rights.
- Even greater risks to human rights than the risks posed by aggressive mitigation action arise from the profound impacts of climate change, especially if temperature increases exceed 2°C, which becomes increasingly likely if mitigation is delayed.
- There is good reason to believe that risks posed by mitigation can be dealt with, provided there is an ambitious and fairly shared global effort to achieve a rapid carbon phase-out while preserving human rights, and a commitment to integrating human rights and equity in all national climate policies. [Tara Shine, Ireland]

Reducing inequalities, there should be discussion on “Sustainability issues in Rural Development in the New Millennium”. The significance of sustainable development (SD) principles at the nexus of the rural sector is the necessity to provide required resources and infrastructural facilities needed for fulfilling living standards (by means of effective utilization of the existing resources for sustainable agricultural development). Considerations of sustainability issues are, therefore, extremely important for rural development. Whenever sustainable rural settlements exist, the government, professional planners, and inhabitants within must focus their energies on the immediate place – they must make the word ‘local’ mean something if we are ever to be successful in the retention and sustenance of “local community”. A rural development doctrine must, if it is to be effective, give deeper and more concentrated thought to the role of local rural place as we seek to find solutions to the ongoing problems of population imbalance and the dissolution of the countryside. [Mishra Santosh Kumar, India]

This chapter covers both rural and urban contexts and their place in (sustainable) development.
In sum, I believe this is one of the stronger chapters in the draft. I am pleased to note it treats sustainable development as a global issue. My enduring concern is that consideration of the inter-depencies between different aspects of sustainable development is dominated by the relationships between environment and poverty. Lifestyles are considered and other social-economic processes such as industrialization, rural-urban migration etc. are mentioned, but there is no sustained treatment of how transformational social and economic processes will impact the sustainable development agenda including the mitigation of climate change. Technological leap-frogging represents both an opportunity and a threat (a major threat) to sustainable development. Oil use is expected to drop and energy security to rise to meet global demand. This has the potential to deliver energy security to billions using renewable technologies but there is no guarantee of success.

Several important issues are not adequately treated in the chapter.

Gender implications of climate change are not sufficiently treated. Further research and a more comprehensive discussion might provide a more balanced treatment of the issue.

Third, it is critical to draw attention to the implications of land-use change and deforestation for sustainable development. The chapter has treated the issue in a fragmented manner. An integrated framework is needed to capture the complexity of the issue.

Fourth, the chapter lacks a critical discussion of the implications of the various 1.5C scenarios for sustainable development. Without a clear understanding of the implications of these scenarios, it is difficult to make informed decisions about the future.

Fifth, the chapter lacks a critical discussion of the implications of the various 1.5C scenarios for sustainable development. Without a clear understanding of the implications of these scenarios, it is difficult to make informed decisions about the future.

Thank you. Some of this literature is now reflected in an expanded assessment in 5.4.

Potential for greater consideration of behavioural economics in how to facilitate societies to act towards climate resilient development. For example, what any!) reports on climate change does that and the scientific community should start discussing it. [João Arthur Pompeu Pavanelli, Brazil]

This is better addressed in Ch4 (implementation and transformation). We avoid repetition between the chapters.

Currently, the benefits and constraints relating to 1.5 and 2 are scattered throughout the report and it hard to get an overview of the issues. Therefore, consider including a summary table towards the end of this chapter that brings together all the benefits and constrants relating to 1.5 vs 2 that are discussed in the report. For instance, an example of a benefit of 1.5 could be: Because ecosystems themselves are sensitive to temperatures and sea level, a 1.5°C global temperature compared to 2°C or higher, is likely to enhance the success and reduce the costs of EBA. While a constraint could be: TRANSFOMING from climate planning to practical implementation is a major challenge in constraining global temperatures to 1.5 °C. Barriers include finance, technology and human resource constrains plus institutional capacity to strategically deploy available knowledge and resources. [Susana De Beaurepaule-Scott, Saint Lucia]

This is better addressed in cross-chapter boxes, including the list on “1.5C warmers” located in Ch5. It is beyond the scope of Ch6 to provide a summary of all benefits and constrants discussed in the entire report.

The tabulation intended to include a discussion within this chapter of the positive and negative impacts on sustainable development from pursuing an aggressive reduction in fossil fuel energy production necessary to limit global warming to 1.0 degrees. In fact, it could be said that we was what set this chapter apart from the others. There is scant attention paid to the negative impacts in particular. I encourage the authors to explore the topic in their revisions to the chapter. Doing so will strengthen the assessment of the science presented in this report. [Farhan Akhtar, United States of America]

Point well taken. A more thorough assessment of the literature highlighting synergies and trade-offs of ambitious mitigation responses and SDGs completed in 5.4. Also see Table 5.1 and fig. 5.3. paid to the negative impacts in particular. I encourage the authors to explore this topic in their revisions to the chapter.

While a discussion on ethics may be relevant in some cases to viewing the impacts and emission pathways associated with global warming of 1.5 degrees it goes beyond the scope of the mandate of the IPCC and its mission to present the objective scientific information and remain policy neutral. Any discussion on ethics should focus solely on establishing a rationale for limiting warming to 1.5 degrees. To remain true to the IPCC’s mission the authors must also consider alternative perspectives, which may disagree with the premise outlined within this chapter, including views of that the stringent emission reduction pathways needed to limit warming to 1.5 degrees will mean economic hardships on communities which are reliant on fossil fuel use and production. The authors should aim if, they choose to pursue this topic, to present and exhaustive review of the relevant literature and views in an objective and neutral manner. [Farhan Akhtar, United States of America]

Ethics do matter for this special report as Ch 1 lays out the importance of ethics in considering global warming of 1.5C, as listed in the plenary approved outline. Our review is comprehensive, including a broad range of ethical and social perspectives.

The executive summary uses uncertainly language (good!) but the rest of the chapter shuns. It is problematic because it takes a rather heroic aggregation of evidence to assemble an uncertainty assessment for a statement in the executive summary if the underlying evidence has not been assessed for uncertainty and confidence. Please ensure that every substantive statement in the chapter makes use of the uncertainty guidance. [Andy Reisinger, New Zealand]

The SOE includes uncertainty language in the chapter text.

While the SDGs may be relevant to conceptualizing ‘sustainable development within the discussion of global warming of 1.5 degrees, the SDGs are not the focus of this report. Authors should stick closely to the mandate given to them from the Panel and not incorporate other goals which broaden the analysis (which may be relevant), but in a capstat world without an environmental emissions (‘green capitalism’), poverty would also increase because of money concentration, structural crisis and unemployment. My suggestion to address the global political economy in because if (any) reports on climate change does that and the scientific community should start discussing it. [Julio-Arthur Pompeu Pavanelli, Brazil]

We have clarified the topics to avoid confusion. All terms are better explained and linkages with the framing chapter where ethics and equity are introduced have been improved. We present divergences in views as emerging from the literature. The text has been streamlined and will be shortened for the final government review.

The extent of discussion of justice, equity and ecological ethics are outside the scope of this report. “The terms ‘justice’ and ‘equity’ are often raised by some, do not have common agreed upon definitions or application in the context of climate change. Moreover, the term ‘justice’ does not appear in the plenary outline for the report or in the UNFCC COP’s evolution to the IPCC; as if a marker that this is an inappropriate framing for the report. Rather, the IPCC should be careful in not ascribing weight to a single sided view of these terms, as this may compromise the principles of the IPCC in presenting a balanced and objective assessment of scientific information and lead to unacceptable policy prescriptive outcomes. The IPCC should not prescribe meanings for these concepts. To do so would compromise the objectiveness of the Panel. [Farhan Akhtar, United States of America]

The plenary-approved outline for Ch5 of this special reports has as its first bullet “Linkages between achieving SDGs and 1.5C “. Here, the SDGs are clearly within the mandate for this chapter and hence addressed here, including opportunities, challenges, risks, and trade-offs of these linkages (as mandated in the plenary-approved outline).

The extensive discussion of justice, equity and ecological ethics are all outside the scope of this report. The terms ‘justice’ and ‘equity’ are often raised by some, do not have common agreed upon definitions or application in the context of climate change. Moreover, the term ‘justice’ does not appear in the plenary outline for the report or in the UNFCC COP’s evolution to the IPCC. As if a marker that this is an inappropriate framing for the report. Rather, the IPCC should be careful in not ascribing weight to a single sided view of these terms, as this may compromise the principles of the IPCC in presenting a balanced and objective assessment of scientific information and lead to unacceptable policy prescriptive outcomes. The IPCC should not prescribe meanings for these concepts. To do so would compromise the objectiveness of the Panel. [Farhan Akhtar, United States of America]

The plenary-approved outline for Ch5 of this special reports has as its first bullet “Linkages between achieving SDGs and 1.5C “. Here, the SDGs are clearly within the mandate for this chapter and hence addressed here, including opportunities, challenges, risks, and trade-offs of these linkages (as mandated in the plenary-approved outline).

We have clarified the topics to avoid confusion. All terms are better explained and linkages with the framing chapter where ethics and equity are introduced have been improved. We present divergences in views as emerging from the literature. The text has been streamlined and will be shortened for the final government review.
10322

Generally I found this Han's too simplistic a picture that you can have your cake and eat it. It misses a literature on the time dimension that shows the if you mitigate CO2 over time SSDGs in the short term even if the long-term is still good. Jacob, M. and J. C. Steen (2014) is cited under trade-offs - but other literature you might want to consider is


18714


18715

Please avoid using tables and figures in text to avoid repetition. [Wilhem Mutumwa, Chile, France]

13733

Analysis should elaborate further on issues related to equity, as mitigation policies could adversely affect the development aspirations of developing countries. [Elen Kaidi, Austria]

3762

Analysis should further elaborate on the interlinkages between a target of 1.5°C and SSDGs. [Elen Kaidi, Austria]

3763

Quantitative analysis on positive and negative impacts should be introduced, including on response measures and economic diversification. [Elen Kaidi, Austria]

6621

This is a structural comment. Currently the chapter builds from reductive analysis to a more systemic, integrated and complex frame. I would find the opposite approach to be more aligned both to an appropriate conceptual response to the climate change and well-being challenge, and to situating the important reductive and specific findings within such a frame. Hence, after the introduction of 5.1 and impact background of 5.2, then 5.7, and working backwards to 5.3 and 5.4, (which struggle currently to provide any policy-conclusive evidence despite a given systemic context). [Emily Tyler, South Africa]

13161

1 100

The risks of mitigation actions for 1.5°C pathways for SD should be assessed in this chapter, including options of how to avoid these, see the title is the same as that of line 1 page 3 [David Mkwambisi, Malawi]

12711

1

This chapter has to walk a tightrope between keeping focussed on the specificities of the 1.5°C world, and giving due weight to the social-scientific and governance framework, some of it very conceptual, that is necessary for policy-relevance. My feeling is present that it is leaning too far in the latter direction, largely because, as the authors say, the literature that can't these discussions to 1.5°C is scarce. In some passages the writing is too dense and abstract, and in others long strings of sources are given for assessment statements that are extremely general in nature. [John Morton, United Kingdom (of Great Britain and Northern Ireland)]

12850

1 92

This chapter is extremely long, and could benefit from a serious culling. Especially the four last sections (5.1-5.2) could be significantly streamlined. [Lisa Schipper, Vietnam]

12651

1 92

I appreciate that the author team have looked back at AR5, but I feel there is a bit too much recapping of what it says. Yes, it is the starting point, but key points from AR5 could perhaps be included in an introductory section. Authors need to look to new literature beyond AR5. [Lisa Schipper, Vietnam]

1909

1 92

The style guide is closely followed for the SSDG.

6621

We have retained the structure from the FOD but have strengthened the evidence for 5.3 and 5.4, with also more literature assessed for 5.7.

13161

Agreed. A systematic assessment of mitigation response options and interlinkages with the SSDGs has been conducted in section 4 (see also table 9.1), and also in 5.8.1.

12711

Agreed. With new and updated literature assessed and incorporated, the chapter text now has more evidence-based findings and less and less conceptual framings, although some are still needed, especially for new concepts (e.g. climate-resilient development pathways).

12850

We are aware of the ultimate page limit of the chapter. We will reduce word length for the final governmental draft.

12651

Agreed. We have updated our assessment on the basis of newly available literature, but have kept references to AR5 where appropriate.

1909

Taken into account. The assessment has been made more specific to 1.5°C throughout the chapter on the basis of newly available literature.

9713

1 1 1 2

According to my understanding, on the chapter name writing, poverty eradication and reducing inequalities are the objectives and the processes of sustainable development that they are not a parallel relationship. Therefore, it is not recommended to put them together in the title. [Kai Fang, China]

9445

2 16 2 21

It is preferable the sequence in dealing with the subject related to the scale so descending from the global scale to sub-regional to sub-national levels. To be 5.2.1.Risks of a 1.5°C Warmer World then 5.2.2. Future Impacts and Risks at Sub-regional to Sub-national Levels [Mohamed Elsharouny, Egypt]

9714

2 28 2 28

The page number "17" should be placed on the right side of the page. [Kai Fang, China]

3963

2 32 2 37

The title is the same as that of line 3 page 3 [David Mkwambisi, Malawi]

9990

2 33 2 37

Water resources issues may be separately addressed [Cecilia Barrios, India]

9715

3 18 2 19

The page number "27" should be placed on the right side of the page. [Kai Fang, China]

9716

4 26 2 26

The page number "37" should be placed on the right side of the page. [Kai Fang, China]

9717

4 25 4 25

The page number "46" should be placed on the right side of the page. [Kai Fang, China]

9718

4 31 4 31

The page number "56" should be placed on the right side of the page. [Kai Fang, China]
The Executive Summary has been updated with more evidence emerging in the literature. The differential impacts for regions are discussed in Ch3.

The Executive Summary has been updated with more evidence emerging in the literature. The differential impacts for regions are discussed in Ch3.

Yes. The SOD includes confidence statements for all chapters.

Confidence statements are explained in Chapter 1 and not repeated here.

The Executive Summary highlights the main findings for this chapter, following the plenary approved outcome. We have considered your suggestions for the underlying sections and included whenever possible and appropriate.

The Executive Summary highlights the main findings for this chapter, following the plenary approved outcome. We have considered your suggestions for the underlying sections and included whenever possible and appropriate.

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The Executive Summary has been updated with more evidence emerging in the literature. The differential impacts for regions are discussed in Ch3.
<table>
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**Comment:** We mention these inequities under climate justice in the underlying sections. Unequal consumption is covered in section 5.4 while discussing interaction with SDGs.

**Response:** Inequities in resource use/consumption fall under the broader issue of climate justice, which is treated in the underlying sections - see e.g. 5.6.2 and the discussion of dialing.

- **19354:** Very High Developed nations are 18% of population but have caused 51% of extractive of natural resources. Low Developed nations are 13% of population and have caused only 2% of extractive - many of which they export to higher developed ([Birgit van Munster, United Kingdom of Great Britain and Northern Ireland](https://www.wmo.int/en/about/)).

  - **Response:** We mention these inequities under climate justice in the underlying sections. Unequal consumption is covered in section 5.4 while discussing interaction with SDGs.

- **19355:** Absolutely not. The connections to the problem, and asymmetry in power to decide solutions: the rich - Very High Developed (18% causing 51%) are never mentioned in the Summary or the 600 page Report, all emphasis is on the poor (13% causing 2%). ([Birgit van Munster, United Kingdom of Great Britain and Northern Ireland](https://www.wmo.int/en/about/)).

  - **Response:** We mention these inequities under climate justice in the underlying sections. Unequal consumption is covered in section 5.4 while discussing interaction with SDGs.

- **19356:** The asymmetry in responsibility and power is clearly reflected in the Report which therefore equally synonyms echo more than 500 times, "development" nearly 1,000 times, "poor" and synonyms nearly 600 times, however "rich", "OEDC", "Industrialized" "Kuwait, Iran" and synonyms are nearly absent, mentioned only 14 times. ([Birgit van Munster, United Kingdom of Great Britain and Northern Ireland](https://www.wmo.int/en/about/)).

  - **Response:** We mention these inequities under climate justice in the underlying sections. Unequal consumption is covered in section 5.4 while discussing interaction with SDGs.

- **19357:** This is important because there cannot be omissions or misrepresentations of the rich. ([Birgit van Munster, United Kingdom of Great Britain and Northern Ireland](https://www.wmo.int/en/about/)).

  - **Response:** We mention these inequities under climate justice in the underlying sections. Unequal consumption is covered in section 5.4 while discussing interaction with SDGs.

- **11478:** I suggest removing "knowledge on" before "the connections". ([Jan Fuglestvedt, Norway](https://www.wmo.int/en/about/)).

  - **Response:** We mention these inequities under climate justice in the underlying sections. Unequal consumption is covered in section 5.4 while discussing interaction with SDGs.

- **2489:** I suggest inserting "knowledge on" before "the connections". ([Jan Fuglestvedt, Norway](https://www.wmo.int/en/about/)).

  - **Response:** We mention these inequities under climate justice in the underlying sections. Unequal consumption is covered in section 5.4 while discussing interaction with SDGs.

- **12297:** I don't think this first sentence is needed to justify the chapter. ([Jan Fuglestvedt, Norway](https://www.wmo.int/en/about/)).

  - **Response:** We mention these inequities under climate justice in the underlying sections. Unequal consumption is covered in section 5.4 while discussing interaction with SDGs.

- **6611:** The language used here assumes that the climate mitigation goal of 1.5 degrees is separate to the SDGs. But there is a climate goal within the SDGs which speaks to 2 degrees and potentially 1.5 degrees. ([Tibor Farago, Hungary](https://www.wmo.int/en/about/))

  - **Response:** We mention these inequities under climate justice in the underlying sections. Unequal consumption is covered in section 5.4 while discussing interaction with SDGs.

- **7378:** Executive summary is very misleading, the writing does not flow in a cohesive fashion ([Arash Paul Antony, United States of America](https://www.wmo.int/en/about/)).

  - **Response:** We mention these inequities under climate justice in the underlying sections. Unequal consumption is covered in section 5.4 while discussing interaction with SDGs.

- **6101:** We mention these inequities under climate justice in the underlying sections. ([British Antarctic Territory](https://www.wmo.int/en/about/))

  - **Response:** We mention these inequities under climate justice in the underlying sections. Unequal consumption is covered in section 5.4 while discussing interaction with SDGs.

- **14140:** We have improved the flow, in alignment with the sections of the chapter. ([Emily Tyler, South Africa](https://www.wmo.int/en/about/))

  - **Response:** We mention these inequities under climate justice in the underlying sections. Unequal consumption is covered in section 5.4 while discussing interaction with SDGs.

- **6612:** We have reformulated this introductory paragraph to stress more the systemic relation between sustainable development and climate action, both by referring explicitly to SDG13 and by pointing toward the analysis of sustainable development pathways, which "seeks synergies and minimizes trade-offs between climate responses of mitigation and adaptation with sustainable development, especially poverty alleviation and reducing inequality". ([Emily Tyler, South Africa](https://www.wmo.int/en/about/))

  - **Response:** We mention these inequities under climate justice in the underlying sections. Unequal consumption is covered in section 5.4 while discussing interaction with SDGs.

- **3702:** The statement has been removed from the Executive Summary. Consistently with the evidence especially poverty alleviation and reducing inequality” We also recognize literature that sees sustainable development and climate action, both by referring explicitly to SDG13 and by pointing toward the analysis of sustainable development pathways, which "seeks synergies and minimizes trade-offs between climate responses of mitigation and adaptation with sustainable development, especially poverty alleviation and reducing inequality". ([Emily Tyler, South Africa](https://www.wmo.int/en/about/))

  - **Response:** We mention these inequities under climate justice in the underlying sections. Unequal consumption is covered in section 5.4 while discussing interaction with SDGs.

- **1855:** We have reformulated this introductory paragraph to stress more the systemic relation between sustainable development and climate action, both by referring explicitly to SDG13 and by pointing toward the analysis of sustainable development pathways, which "seeks synergies and minimizes trade-offs between climate responses of mitigation and adaptation with sustainable development, especially poverty alleviation and reducing inequality". ([Emily Tyler, South Africa](https://www.wmo.int/en/about/))

  - **Response:** We mention these inequities under climate justice in the underlying sections. Unequal consumption is covered in section 5.4 while discussing interaction with SDGs.

- **15046:** The terms 'development' and 'poverty' are mandated for this special report. Text includes reference to high-income countries (HICs), e.g. in 5.6. The authors task is to assess the available literature and present multiple lines of evidence, where available.

  - **Response:** We mention these inequities under climate justice in the underlying sections. Unequal consumption is covered in section 5.4 while discussing interaction with SDGs.
### Comment Response - Chapter 5

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<td>&quot;an ethical imperative? The introduction of the word ethics is a little abrupt, and it is suggested to extend it slightly to indicate the logical relationship between ethical and 1.5°C large.&quot; [Jari Fugleved, Norway]</td>
<td>This statement has been modified and the linkage to the underlying sections highlighted (traceable account). Consistently with the evidence from the literature, the focus has been better put on the enabling conditions for achieving the twin climate-development objectives while acknowledging the growing literature on ethics and equity in the context of climate change and a 1.5°C warmer world.</td>
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<td>&quot;but possible is a strong message and in my view, some more nuances in terms of the different dimensions of feasibility could be used here. A direct reference to the underlying section for this statement would be useful.&quot; [Jari Fugleved, Norway]</td>
<td>This statement has been modified.</td>
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<td>19662</td>
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<td>&quot;It will be only possible when concerted actions are taken by all the countries, all stakeholders.&quot; [Gurum Rafal, Nepal]</td>
<td>This statement has been formulated. We rather put the emphasis on the enabling conditions for this transformation to be feasible (consistently with framing from the cross-chapter box on &quot;feasibility&quot; in Chap 1) while acknowledging the growing literature on ethics and equity in the context of climate change and a 1.5°C warmer world.</td>
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<td>&quot;A strong message this chapter gives is that SD and achieving 1.5 and achieving 1.5 and eradicating poverty are possible and desirable. The next step is to be clear on what is needed to ensure that this is feasible and equitable. Our research finds that Zero carbon is compatible with achieving the right to development, with a shift to Sustainable Development, poverty eradication and a more equitable and inclusive model of development if: a) All countries are enabled to participate in the transition on the same timeline; b) Human rights and gender equality inform all climate and sustainable development actions.&quot; [Tara Shine, Ireland]</td>
<td>This sentence has been modified.</td>
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<td>&quot;it will only possible when concerted actions are taken by all the countries, all stakeholders.&quot; [Gurum Rafal, Nepal]</td>
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<td>&quot;The scientific basis of the following statement is one of the most important messages from the SR15 for policymakers and general communities: &quot;Staying within 1.5°C of global warming compared to pre-industrial times while simultaneously achieving the Sustainable Development Goals (SDGs) is challenging, but possible, and an ethical imperative (high confidence).&quot; The chapter includes significant aspects of the balanced approach towards e.g., adaptation and mitigation, options for CRDP’s etc., however, it is unclear how the above fundamental affirmative statement stems from the assessments in various sections. That statement corresponds to FAQ 5.4. It would be essential to list a few bulleted, justifying arguments under that statement, backed with some key points from all sections. Some possible items are given as the next comment to line 17 on page 5. [Tibor Farago, Hungary]</td>
<td>This statement has been modified. We rather put the emphasis on the enabling conditions for this transformation to be feasible (consistently with framing from the cross-chapter box on &quot;feasibility&quot; in Chap 1) while acknowledging the growing literature on ethics and equity in the context of climate change and a 1.5°C warmer world.</td>
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<td>&quot;I would question the assertion that there is 'high confidence' that staying within 1.5°C and at the same time meeting the SDG goals is possible. As the text mentioned, it is undoubtedly a challenge. Indeed, a challenge that is almost certainly possible given the commitments and economic/social transformations that are required. Perhaps it depends on your definition of 'possible', but I would argue that this is currently not correct and may mislead the reader. Indeed, the synthesis section of the chapter notes that limited evidence exists to date that explicitly examines or measures the implications of a 1.5°C warmer world (and overshoots) for sustainable development. How can these therefore be strong evidence that achieving both (limiting 1.5 and meeting SDG targets) is possible?&quot; [Lindsey Jones, United Kingdom (of Great Britain and Northern Ireland)]</td>
<td>This statement has been formulated. We rather put the emphasis on the enabling conditions for this transformation to be feasible (consistently with framing from the cross-chapter box on &quot;feasibility&quot; in Chap 1) while acknowledging the growing literature on ethics and equity in the context of climate change and a 1.5°C warmer world.</td>
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<td>&quot;Is there any assessment of evidence possible in this very crucial statement?&quot; [J. David Tabara, Spain]</td>
<td>Thank you</td>
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<td>&quot;Explain clearly why authors are confident that 1.5-degree target and achieving SDGs is possible. In reading previous chapters, readers are inclined to think that 1.5-degree target itself would not be achievable unless many countries raise their ambitions (NDC) for 2030. And there are descriptions in chapter 2 and 4 that we are not sure whether voluntary NDCs would be implemented or not. Under these conditions, readers wish to know the reason why authors can say both 1.5-degree target and pursuance of SDGs are mutually supportive with high confidence. [Mitsutsune Yamaguchi, Japan]</td>
<td>This statement has been formulated. We rather put the emphasis on the enabling conditions for this transformation to be feasible (consistently with framing from the cross-chapter box on &quot;feasibility&quot; in Chap 1) while acknowledging the growing literature on ethics and equity in the context of climate change and a 1.5°C warmer world.</td>
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<td>&quot;SDGs (acronym) has already been explained in the page 5 line 7. [Marina Kenako, Japan]</td>
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<td>&quot;Definition of high (medium and low) confidence should be clarified in the executive summary. [Mitsutsune Yamaguchi, Japan]</td>
<td>This statement has been formulated. We rather put the emphasis on the enabling conditions for this transformation to be feasible (consistently with framing from the cross-chapter box on &quot;feasibility&quot; in Chap 1) while acknowledging the growing literature on ethics and equity in the context of climate change and a 1.5°C warmer world.</td>
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<td>&quot;Can you put a level of confidence on an ethical imperative? Please consider putting the confidence level after 'challenging, but possible' for a clearer, stronger statement.&quot; [Heid Jerstad, United Kingdom (of Great Britain and Northern Ireland)]</td>
<td>Yes. Corrected.</td>
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<td>&quot;Rephrasing to avoid the similarity in the literature. [Ahmed Zulhas, United Kingdom (of Great Britain and Northern Ireland)]&quot;</td>
<td>Confidence statements are explained in Chapter 1 and not repeated here.</td>
</tr>
</tbody>
</table>
Some possible items for justifying the statement "Staying..." on lines 14-16: "As risks increase with every level of additional warming, avoided future impacts can be expected when global warming is limited to 1.5°C rather than 2°C (5.3.3). Limiting warming to 1.5°C is expected to provide better chances to achieve the SDGs, with higher potential to eradicate poverty, reduce inequality, and foster equity. Yet, the literature points out that the expected scenario further commends the challenge of reaching these goals (5.2.4.1). These are scenarios and trade-offs between the dual goal of keeping temperatures below 1.5°C and achieving sustainable development (5.3)." Win-win outcomes to plan and prepare for 1.5°C global warming and higher local warming, will be increasingly difficult to achieve without redistributive measures and built-in procedural justice mechanisms to meet the SDGs, particularly poverty eradication and reducing inequalities (5.3.3) etc. [Tibor Farago, Hungary]

We don't understand this comment. There is only 1 word in Line 16 and no word in line 17

Some possible items for justifying the statement "Staying..." on lines 14-16: "As risks increase with every level of additional warming, avoided future impacts can be expected when global warming is limited to 1.5°C rather than 2°C (5.3.3). Limiting warming to 1.5°C is expected to provide better chances to achieve the SDGs, with higher potential to eradicate poverty, reduce inequality, and foster equity. Yet, the literature points out that the expected scenario further commends the challenge of reaching these goals (5.2.4.1). These are scenarios and trade-offs between the dual goal of keeping temperatures below 1.5°C and achieving sustainable development (5.3)." Win-win outcomes to plan and prepare for 1.5°C global warming and higher local warming, will be increasingly difficult to achieve without redistributive measures and built-in procedural justice mechanisms to meet the SDGs, particularly poverty eradication and reducing inequalities (5.3.3) etc. [Tibor Farago, Hungary]

We don't understand this comment. There is only 1 word in Line 16 and no word in line 17

We have removed this term from the ES. The underlying text in 5.3 refers to poverty traps, and not to carbon lock-ins (a term that is used in the literature).

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1990 5 46 5 46 ‘or carbon remoting modern energy sources’ or carbon remoting energy sources (explanation: many of these sources are not ‘modern’ but were used already in the past like solar or wind energy. Include etc). (Tibor Farago, Hungary)

Dine.

19775 5 46 5 47 To manage these transitions use rigips based approaches. See examples in Rights for Action and on the Business and Human Rights Resource Centre database. (Tara Shore, Ireland)

Dine.

7220 5 47 This chapter could make more use of the links between alleviating energy poverty with off-grid renewable energy (much of the text is not elaborated by mobile banking) and sustainable development. Gorton Mr Grenahan indicates that many of the emergent opportunities and benefits are “engendered” meaning they reduce the burden on women in energy. This significant trend started in East Africa and has spread to West Africa and SE Asia. Bangladesh has 4 million solar home units. PAVG energy investment increased from $158bn in 2015 to $220bn in 2016. The mini-grid market is now worth over $10bn annually. This trend is driven by falling PV prices, urbanisation and energy poverty and might make for a better illustration of low carbon SD that some of the existing examples. See Kevin Wallin’s report for the Africa Progress Panel (2015 and 2017) as one example that contains other literature, as we as Sarah Colburn-Carder’s work (Anton-Cartwright, South Africa)

Human rights and equity are explicitly acknowledged as crucial enablers for maximizing sustainable and climate-resilient development pathways and climate action.

7736 5 46 5 48 Check the spelling of competition in the sentence. It currently spells as competition (Ashraf Paul Antony, United States of America)
Corrected.

11855 6 46 5 48 The word is misspelt ‘Sustainable Development (of Great Britain and Northern Ireland)
Corrected.

19330 5 46 5 46 competition instead of “competition” (Marco Mazzotti, Switzerland)
Corrected.

9720 5 46 5 48 Replace ‘competition’ by ‘competition’ (Kai Fang, China)
The Executive Summary highlights the main findings for this chapter, following the planey approved outline. We have considered your suggestions for the underlying sections and included wherever possible and appropriate.

Corrected.

12081 5 51 5 51 Industry could mean different things. It might be useful to clarify. It could mean land management for conservation and carbon sequestration. It could mean harvesting of timber to general income. It could possible mean both of these things. (Tidball, David China)
These references are indeed very important, but support the discussion on emission pathways (Chap 2) and implementation (Chap 4)

1991 5 52 5 52 ‘strategies towards 1.5°C’ – a summaries towards the global 1.5°C warming limit (explanation: average +1.5°C is already the situation in some areas/countries.) (Tibor Farago, Hungary)
Clearer wording is included, differentiating explicitly the different activities and their purposes

4199 6 1 4 1 While the immediate impacts of air pollution are experienced in the area in which it is generated, air pollution in one region of the world will affect the air quality in another. The jet-stream and weather pattern result in the mixing and transport of air pollution. (Michelle Leslie, Canada)
No specific time number. Side-effects and synergies associated to mitigation efforts are the core of the analysis of mitigation response options in the executive summary and corresponding sections. Insights on the way to minimize the negative impacts are discussed

5455 6 1 1 1 It is suggested to delete “would”. The reason being that this statement is true and that currently the world is neither on a 1.5 nor a 2°C pathway but on a 3 or 4 degrees pathway. (Klaus Radunsky, Austria)
Thanks for the explanation. This level of detail is not relevant for an executive summary

19778 6 1 6 3 Reference work on the right to health and climate change by the OHCHR and WHO. For example the report of OHCHR available here http://www.ohchr.org/EN/HumanRights/HumanRightsIssues/ClimateChange/Pages/StudyImpact.aspx (Tara Shore, Ireland)
Done.

1982 6 2 6 2 Compared to pathway that stay below 2°C. “a compared to pathways that lead to higher global warming. (or compared to pathways that lead to 2°C global warming.) (explanation not the reduction pathway) stay below 2°C and actually 1.5°C is also below 2°C) (Tibor Farago, Hungary)
Both. Details are in the chapter.

14297 6 2 6 2 Indoor or outdoor air pollution, or both? They’re often treated differently because they arise differently. (Jason Donev, Canada)
Noted, thank you.

20075 6 5 6 18 This topic of security and human security has not appeared and the risks and issues to be introduced together with governance and policies. In discussing different mitigation and adaptation options, these topics are usually discussed and they might be implied already in governance but it’s not clear. For example, why a mitigation or adaptation response, or the governance responses don’t address issues such as theft, crime, the elderly or those with disabilities (ex. using public transportation). Of course, this comment might apply better in another section of the chapter. (Deborah Ley, Guatemala)
Approved.

6103 6 5 6 7 Perhaps this could be rephrased slightly. Maybe that effectively prioritise human well-being. (Frederick, United Kingdom [of Great Britain and Northern Ireland])
Thans. Dine.

19779 6 5 6 9 Human rights standards and frameworks can help to prioritise human wellbeing and equity in policy choices. See (Rights for Action) (Pilgrim People at the Centre of Action on Climate Change (Nov 2015). Online at http://www.mrfcj.org/EN/Issues/HRAndClimateChange/Pages/StudyImpact.aspx (Tara Shore, Ireland)
The topic of security is explicitly discussed in several parts of the chapter and in the executive summary

1863 6 7 6 7 Keep global warming within the 1.5°C limit. A keep global warming to the 1.5°C limit (explanation ‘keep within’ means different approach and it was not mentioned by the Paris Agreement) (Tibor Farago, Hungary)
Thank you. We have considered this reference for the underlying sections.

12865 6 7 6 7 Igo, should be ‘global warming’ (Johanna Naas, Australia)
We interpret the 1.5C goal consistently with the definition in Chap 1. We also explicitly mention the question of overshoot, leading to temporary higher temperature increases.

11586 6 7 6 7 The word warning is misspelt (Sandra Nelles, United Kingdom (of Great Britain and Northern Ireland)
Corrected.

We have deleted the word ‘easier’ in the revised text, as it was indeed confusing and not accurate. This has been reformulated by pointing to the risks of delaying actions (5.4) and the need for a dynamic view to manage the trade-offs (5.5.4)
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<td>10549</td>
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**Comment:**

- The term 'development' used here is generally and to some degree associated with a particular model of development, followed in the twentieth century. It can be argued that aspects of this model got us into or at least exacerbated the climate problem we have now.
- The expression 'Global North' which is also included in page 36 line 84, section 5.7.1.1; is parenthesis and adversative expression (related to an engaging one...). It is related to evidence of climate change (dealing not necessarily to a model of social science (being popular in part of the strong movement). I wonder if the authors could enumerate specifically which countries form part of the Global North or (Global South) or even if such enumeration would be useful at all, particularly in the context of this report, which covered ambition to find a global response and not only some of the most immediate construction of the global south or north. (J. David Tabara, Spain)
- The learning required is iterative, but most importantly adaptive, as decision making will need to be adapted to an evolving situation, which has so far been unable to do. (Davide Natalini, United Kingdom [of Great Britain and Northern Ireland])
- The challenges of participatory processes are acknowledged, notably in the light of multi-level, multi-sector, processes, actors and outcomes linking issues of power and policy.
- A number of relevant reports at the global level and regional level, such as the ones mentioned below, have been published that have addressed the interrelationships between sustainable development, poverty, inequality and climate change and are thus recommended for use as IPCC source material. (Miguel Gonzalez, Nigeria)
- General Comments and Recommendation. Paper is mostly based on 'what is' (that is, 'the state of the act'). I had rather expected not only what is but also that the paper should answer the question of 'how'. For example: how to tackle some of the challenges mentioned in the paper based on poverty eradication, reducing inequality and sustainable development. Or measures taken so far in addressing such challenges and its outcomes. Besides that, many terms used are well defined. It made it easier to understand and to trace the mind-set of the writers.

**Response:**

- We have deleted the word "easy" in the revised text, as it was indeed confusing and not accurate. This has been reformulated by pointing to the risks of delaying actions (5.4.2) and the need for a dynamic view to manage the trade-offs (5.5.4).
- Thank you. We have considered this reference for the underlying sections.
- Thank you, we have considered this point for the underlying section (5.5.6.2) and mention the question of rights in the executive summary and also in FAQ22.
- Thank you. We have considered this point for the underlying section (5.5.6.2) and mention the question of rights in the executive summary and also in FAQ22.
- The "climate-related development pathways" explicitly acknowledge the roles of fairness and equity, and the need to differentiate the approach to development according to the context-specific circumstances and at the level of individuals, communities and groups. This is now explicitly detailed in the executive summary. The underlying text is in 5.5.6.2 and FAQ22.
- The adaptive nature of learning is acknowledged in the corresponding sections of the chapter, notably prominently in the section 5.6.3
- The Global North is not mentioned anywhere in the executive summary
- The Global North is not mentioned anywhere in the executive summary
- We have deleted the word "easy" in the revised text, as it was indeed confusing and not accurate.
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<td>7173</td>
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<td>African Development Bank (ADB). 2011. <em>The Cost of Adaptation to Climate Change in Africa</em>. Abidjan: ADB. Retrieved from <a href="https://www.adb.org/documents/project-and-operations/1160181646013035120/Population-poverty-and-climate-change">https://www.adb.org/documents/project-and-operations/1160181646013035120/Population-poverty-and-climate-change</a> Abstract: Africa is arguably the most vulnerable region in the world to the impacts of climate change. The majority of both bottom up and top down (‘integrated assessment’) studies suggest that damages from climate change, relative to population and GDP, will be higher in Africa than in any other region in the world. This is corroborated by the analysis using the Regional Integrated Model of Climate and the Economy (RICE) model in this review: this suggests that climate damages in Africa, as a percentage of GDP, may be 10% higher than the next most exposed region (India) and more than twice as high as in the US, Russia, Europe and Latin America. Breaking these impacts into specific sectors or components further illustrates these vulnerabilities, with recent studies into health, agriculture and water all demonstrating that Africa is often more vulnerable to climate change along these dimensions than any other region. [Miguel Gonzalez, Nigeria]</td>
<td>Noted: but we are focusing on references since 2013</td>
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<td>African Development Bank (ADB). 2015. <em>African Development Report 2015</em>. Growth, Poverty and Inequality Nexus: Overcoming Barriers to Sustainable Development, Abidjan: ADB. Retrieved from <a href="https://www.adb.org/documents/project-and-operations/1160181646013035120/Population-poverty-and-climate-change">https://www.adb.org/documents/project-and-operations/1160181646013035120/Population-poverty-and-climate-change</a> Abstract: Despite earlier periods of limited growth, African economies have grown substantially over the past decade. However, poverty and inequality reduction has remained less responsive to growth success across the continent. How does growth affect poverty and inequality? How can Africa overcome contemporary and future sustainable development challenges? This 2015 edition of the African Development Report (ADR) offers analysis, synthesis and recommendations that are relevant to these questions. The objective of this Report is to guide policy processes by contributing to the debate analyzing what has happened during recent years, what has worked well, what hasn’t worked well, and what needs to be done to address further barriers to sustainable development in Africa? Africa’s recent economic growth has not been accompanied by a real structural transformation. As a result, billions of Africans, especially women and youth, have been left behind. The Report highlights the intermedial role of various forms of ‘inequality that limit the transformation of Africa’s growth into prosperity for all. Unequal access to economic resources and opportunities is mirrored in the continent’s high income inequality, gender gaps in earnings and opportunities, the rural-urban divide, youth under-employment and in the limited priority given to key poverty-reducing sectors like agriculture, agro-industries, and manufacturing. [Miguel Gonzalez, Nigeria]</td>
<td>Noted: but we do not have space to discuss regions in detail in this section</td>
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<td>7175</td>
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<td>Das Gupta, M. 2013. <em>Population, Poverty, and Climate Change</em>. Policy Research Working Paper no. WPS6351. Washington, DC: World Bank. Retrieved from <a href="http://documents.worldbank.org/curated/en/116181468163465130/Population-poverty-and-climate-change">http://documents.worldbank.org/curated/en/116181468163465130/Population-poverty-and-climate-change</a> Abstract: This literature review focuses on the relationships between population, poverty, and climate change. Developed countries are largely responsible for global warming, but the brunt of the fallout will be borne by developing countries in forms such as lower agricultural output, poorer health, and more frequent natural disasters. Although carbon emissions per capita have leveled off in developed countries, they are projected to rise rapidly in developing countries because of economic growth and population growth. Unfortunately, the latter will rise most notably in the poorest countries, combining with climate change to slow poverty reduction. These countries have many incentives to lower fertility. Previous studies indicate it in high fertility settings, fertility decline facilitates economic growth and poverty reduction. It also reduces the pressures on biodiversity and these resources that can be used to cope with climate change. Moreover, slowing population growth helps alleviate some of the projected global warming, which will benefit the poorest countries far more than it will benefit developed countries that face higher latitudes and/or have more resources to cope with climate change. Natural experiments indicate that family-planning programs are effective and highly pro-poor in their impact. While the rest of the world seethes with the complexities of reducing emissions, the poorest countries will benefit from simple programs to lower fertility. [Miguel Gonzalez, Nigeria]</td>
<td>Noted: but we do not have space to discuss in this introduction. It is noted in other sections of report</td>
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<td>Linham, M. M. and Nicholls, R. J. 2010. <em>Technologies for Climate Change Adaptation: Coastal Erosion and Flooding</em>. United Nations Environment Programme (UNEP) Risø Centre on Energy, Climate and Sustainable Development. Roskilde, Denmark: UNEP. Retrieved from <a href="http://www.adb.org/pdf?pdf/41190/CoastalErosionFunding.pdf">http://www.adb.org/pdf?pdf/41190/CoastalErosionFunding.pdf</a> Abstract: This guidebook reports on technologies for climate change adaptation on coastal zones, which in many parts of the world are densely populated centres of critical economic activity. Sea level rise and more intense storms, waves, and surge lead to climate change as a serious threat to large numbers of people living in these areas. Consequently many developing countries have identified coastal zones as a priority area for climate change adaptation. These countries, however, often need assistance to identify adaptation options, formulate adaptation strategies and plans, and implement adaptation measures that lower the risk and actual losses from climate change impacts. This publication aims to support good adaptation planning. It covers thirteen major adaptation technologies that reduce impacts of coastal erosion and flooding due to climate change. For each, the technology is described, advantages and disadvantages assessed, costs and benefits estimated, institutional or organizational requirements outlined, and detailed examples provided that illustrate how the technology can be applied. It is hoped that this comprehensive approach will make the guidebook a useful reference for policy makers and coastal zone project planners. Its reader-friendly style and extensive coverage also make it a good resource book for anyone interested in the topic. [Miguel Gonzalez, Nigeria]</td>
<td>Noted: but we are focusing on references since 2013</td>
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<td>Overseas Development Institute (ODI). 2013. <em>The Geography of Poverty, Disasters and Climate Extremes in 2030</em>. London: ODI. Retrieved from <a href="https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/8633.pdf">https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/8633.pdf</a> Abstract: This report examines the relationship between poverty and disasters. It concludes that, without concerted action, there could be up to 325 million extremely poor people living in the 49 countries most exposed to the full range of natural hazards and climate extremes in 2030. It maps out where the poorest people are likely to live and develops a range of scenarios to identify potential patterns of vulnerability to extreme weather and earthquakes-who is going to be vulnerable and why. These scenarios are dynamic: they consider how the threats may change, which countries face the greatest risk and what role can be played by disaster risk management (DRM). [Miguel Gonzalez, Nigeria]</td>
<td>Noted: this section is not in SGO</td>
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7178 7 46 United Nations Development Programme (UNDP). 2008. Human Development Report 2007/2008. Fighting Climate Change. Human Solidarity in a Divided World. New York: UNDP. Retrieved from http://hdr.undp.org/default/main/2008_en_complete.pdf [Abstract]: This report establishes the need for limiting future climate change and for helping the most vulnerable adapt to what is unavoidable, and that one has to move on and identify the nature of the policies that will help us get the result we seek. It states that several things can be said about the outset: first, non-marginal changes are needed, given the pace of the world on one hand and political change and ambitions new policies. Second, there will be significant short-term costs to the world in limiting climate change. There will be large net benefits over time, but at the beginning, we must be willing to incur the costs. It continues that this will be a challenge for democratic governance: political authorities will have to pay for the costs needed to reach the long term goals. The report concludes that leadership at the national level will require looking beyond electoral cycles, and mandates that they are not too paternalistic. It relates to the fact that in the fight against the much higher inflation rates of the distant past, democracies did come up with the institutions such as more autonomous central banks and policy pre-commitments that allowed much lower inflations to be achieved despite the short term temptations of reacting to the printing press. The same has to happen with climate and the environment: societies will have to pre-commit and forgo short term gratification for longer-term well-being. [Miguel Gonzales, Nigeria] Noted. but we are focusing on references since 2013
7179 7 46 World Bank. 2010. World Development Report 2010. Development and Climate Change. Washington, D.C. World Bank. Retrieved from http://documents.worldbank.org/ntv/WOR2010/Resources/5237678-1220014527527/WD10-Full-Text.pdf [Abstract]: This report indicates that poverty reduction and sustainable development remain core global priorities and that a quarter of the population of developing countries still lives on less than $1.25 a day, one billion people lack clean drinking water, 1.6 billion, electricity, 3 billion, adequate sanitation; and a quarter of all developing country children are malnourished. It emphasizes that addressing these needs must remain the priorities of both developing countries and of development aid—recognizing that development will get harder, not easier, with climate change. The report also states that climate change must urgently be addressed and that climate change breakthroughs are possible, with countries developing countries is the most vulnerable of the countries and that they would face some 75 to 85 percent of the costs of damages caused by the changing climate. It concludes that even 2°C warming above preindustrial temperatures—the minimum the world is likely to experience—could result in permanent reductions in GDP of 4 to 5 percent for Africa and South Asia. It determines that most developing countries lack sufficient financial and technical capabilities to manage increasing climate risks: developing countries also depend more directly on climate-sensitive natural resources for income and well-being and most are in tropical and subtropical regions already subject to highly variable climate. [Miguel Gonzales, Nigeria] Rejected: we are focusing on references since 2013 and this was already discussed in AR5
7180 7 46 World Health Organization (WHO). 2003. Climate Change and Human Health: Risks and Responses. Subsaharan. WHO. Retrieved from http://www.who.int/globalchange/publications/branching/pdf/Abstract]: This report summarizes that a policy-focused assessment is a valuable process for providing timely and useful information to decision-makers, resource managers and other stakeholders in the public health community. It states that it has been argued that the existence of scientific uncertainties precludes policymakers from taking action today in anticipation of climate change—this is not true. The report presents that in fact policymakers, resource managers and other stakeholders make decisions every day, despite the existence of uncertainties. The outcome of these decisions may be potentially affected by climate change or the decision-makers may not foresee future opportunities to adapt to climate change. Hence, the decision-makers would benefit from information about climate change and its possible impacts. The entire process of policy-focused assessment is premised on the need to inform the existence of uncertainties. It is also noteworthy that policy-focused assessments already have influenced policy and resource management decisions in the areas of public health community. [Miguel Gonzales, Nigeria] Rejected: we are focusing on references since 2013 and this was already discussed in AR5
7744 7 1 45 70 The overall 5th chapter seems like it’s very repetitive with the same points being made in multiple different ways. I understand the need to try and capulate everything out there but maybe being a bit concise might help. [Arthur Paul Antony, United States of America] We have eliminated unnecessary repetition throughout the chapter. We will be working toward the most concise final governmental draft due in May 2018.
1894 7 10 From the level of nation states to communities. A from global level to the level of nation states to communities. [explanation: this chapter refers also to global aspects likewise the SDGs)) [Tibor Farago, Hungary] Accepted: reference to scales has been dropped
11089 7 13 7 13 I’m afraid I don’t understand the selection of such a short array of SDGs for this chapter, or at least this is not well justified. There are many more that are relevant for this chapter, for example. The publication of the selection of poverty, equality and equity for this chapter should be justified. [Davide Navolini, United Kingdom of Great Britain and Northern Ireland] Taken into account: We do not only focus on poverty and equality - we look at these and the full range of SDGs as requested in the approved outline
20547 7 13 7 13 In this section or even earlier in the chapter. It is vital that this acknowledgement given to the North-South divide in research and its implications for climate change policy and practice. Behavioral, M.; Smith, R.J.; Kuchar, M.; Aragwe, G.K.; Gutierrez, J.M.; Rasadanai, A.; Hay, S.; Koller, S.H.; Marjit, S.; Mohamed, H.M.; Maggs, H.H.; Solomon, N.W.; Van Slade, J. and McAuley, D (2017) Steps to overcome the North-South divide in research relevant to climate-change policy and practice. Nature Climate Change, 7(1), 21-27. [These authors contributed equally to this work. Richard J. Smithers, United Kingdom of Great Britain and Northern Ireland] Noted. This applies to whole report and we will mention, in summary and research gaps for our chapter, the need for country-driven analyses in all local and national contexts,
10869 7 13 8 28 The section defines terms and concepts, but for the concept of human "well-being" is used throughout the chapter but not defined. In fact, the mono-maniacal and monocentric literature on human well-being as measured by self-reported cognitive evaluations of life should likely be referenced here in part because it is increasingly prominent in actual indicators of progress designed by governments at all scales from int’l to local, and by NGOs (Barrington-Leigh, C. P. and Alice Escande, "Measuring progress and well-being: A comparative review of indicators," Social Indicators Research, 2010.100(15205)1-15(6)., 2013). In part because, maybe more than other, objective, it is measured, it has the potential to be attracted (already improved) even during policy transformations that are also characterized by stringent mitigation and adaptation goals (Barrington-Leigh, C. "Sustainability and Well-Being: A Happy Synergy," Development (2016) 59: 292. https://doi.org/10.1057/s41301-017-0113-x. There are plenty of authoritative sources on the measurement of such "subjective well-being" and on its use in guiding government policy as the ultimate social objective. [UK Office for National Statistics. 2011. Measuring what matters: National statistician’s reflections on the national debate on measuring national well-being. Newport, South Wales: Office for National Statistics. https://www.ons.gov.uk/guide-method/user-guidance/well-being/publications/measuring-what-matters-national-statistician’s-reflections-on-the-national-debate-on-measuring-national-well-being.pdf] [Annual "World Happiness Reports" from the USDI (as) [Barrington-Leigh Christopher, Canada] Accepted: Sentence added with references
<table>
<thead>
<tr>
<th>Comment No</th>
<th>From Page</th>
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<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>18850</td>
<td>7</td>
<td>15</td>
<td>7</td>
<td>16</td>
<td>Sustainable development has been defined in many ways and in prior IPCC reports as...</td>
<td>Sentence now changed and avoids duplication. But some of the discussion on SD has been moved to Chapter 1</td>
</tr>
<tr>
<td>1895</td>
<td>7</td>
<td>15</td>
<td>7</td>
<td>17</td>
<td>Actually the CH1 references only the 1st. Definition from the WCC-RD-report (Bundtland-report, 1987) is prominent. As discussed in Chapter 1.</td>
<td>Accepted: reference added. But some of the discussion on SD has been moved to Chapter 1</td>
</tr>
<tr>
<td>18851</td>
<td>7</td>
<td>15</td>
<td>7</td>
<td>17</td>
<td>As discussed in Chapter 1. Sustainable development has been defined in many ways and in prior IPCC reports was defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs.</td>
<td>Accepted. But some of the discussion on SD has been moved to Chapter 1</td>
</tr>
<tr>
<td>7124</td>
<td>7</td>
<td>15</td>
<td>7</td>
<td>17</td>
<td>Isn’t the Brundtland’s definition and not IPCC?! Maybe she could be referred to here. [Irka Mato, Sweden]</td>
<td>Accepted: The origin is mentioned in CH1 and a reference has been added</td>
</tr>
<tr>
<td>1724F</td>
<td>7</td>
<td>16</td>
<td>7</td>
<td>17</td>
<td>The definition given here is a Bundtland Commission’s definition from the report Our Common Future. The origin of the term sustainable development must be mentioned somewhere in this report. [Hrmagnee Gupta, India]</td>
<td>Taken into account: The origin is mentioned in CH1 and a reference has been added</td>
</tr>
<tr>
<td>11479</td>
<td>7</td>
<td>19</td>
<td></td>
<td></td>
<td>I should replace the word “balancing”. Sustainable development is less about balancing competing goals than it is about looking for synergies: co-existence of growth that enhances social and environmental values. The term “environmental protection” should also be replaced because sustainable development is as much (or more) about enhancing ecosystems processes as it is about conserving and protecting. [Stewart Lockie, Australia]</td>
<td>Noted: section rewritten and more monographs synergies. But some of the discussion on SD has been moved to Chapter 1</td>
</tr>
<tr>
<td>11460</td>
<td>7</td>
<td>20</td>
<td></td>
<td></td>
<td>No context over goals relevant to this report given the 2030 Agenda was cut internationally agreed goals! I see the point but this could cause confusion among readers. The important point and one that should be highlighted is that material assessment is a challenge. [Stewart Lockie, Australia]</td>
<td>Noted. But some of the discussion on SD has been moved to Chapter 1</td>
</tr>
<tr>
<td>1695</td>
<td>7</td>
<td>24</td>
<td></td>
<td></td>
<td>The 2030 Agenda (its para. 14) also refers to this connection, so I propose to add: ... [PlurCB et al. 2014]. The 2030 Agenda adopted by the UN General Assembly also underlines this interconnection: “Climate change is one of the greatest challenges of our time and its adverse impacts undermine the ability of all countries to achieve sustainable development.”</td>
<td>Thank you. Good point. Sentence added. But some of the discussion on SD has been moved to Chapter 1</td>
</tr>
<tr>
<td>7535</td>
<td>7</td>
<td>24</td>
<td>7</td>
<td>29</td>
<td>Please consider to delete the word “geogenieing”. The sentence mentions mitigation and adaptation, and to a large extent the different options related to geoengineering will be covered under mitigation. Furthermore, if you want to specify issues related to e.g. negative emission options it would be better to mention the individual options. Also, according to the final outline of the AR6 scoping [IPPC-46 Montreal September 2017] this term is not used explicitly in the outline. These options are more dealt with individually because they are very different by nature. See the description given in Chapter 4.</td>
<td>Noted: but here we are discussing AR5 which does use the term. In other sections of the chapter we do talk at individual options such as SMA. This report decided to deal with SMA as separate from mitigation</td>
</tr>
<tr>
<td>4712</td>
<td>7</td>
<td>27</td>
<td>7</td>
<td>28</td>
<td>Three types of responses to climate change? Mitigation, adaptation AND GEOENGINEERING? Change the sentence “ – mitigation, adaptation, and geoengineering” – to “ – mitigation and adaptation including some geoengineering methods –”. [Rudolf Toose, Czech Republic]</td>
<td>Geogenieing deleted here but discussed later in chapter. This report sees SRM as neither mitigation or adaptation</td>
</tr>
<tr>
<td>15706</td>
<td>7</td>
<td>28</td>
<td>7</td>
<td>29</td>
<td>In the case of geoengineering, there is NO positive impacts or distributional aspects, so please correct the sentence to separate the “positive and negative” impacts of mitigation referred to geoengineering. Either deleting the reference or separating it from the potential “positive” impacts, as geoengineering is not even mitigation or adaptation thus should not be placed in the same level. [Elenda Dahi, Philippines]</td>
<td>Geogenieing deleted here but discussed later in chapter. The report sees SRM as neither mitigation or adaptation</td>
</tr>
<tr>
<td>15458</td>
<td>7</td>
<td>28</td>
<td>7</td>
<td>29</td>
<td>In the case of geoengineering, there is NO positive impacts or distributional aspects, so please correct the sentence to separate the “positive and negative” impacts of mitigation referred to geoengineering. Either deleting the reference or separating it from the potential “positive” impacts, as geoengineering is not even mitigation or adaptation thus should not be placed in the same level. [Elenda Dahi, Philippines]</td>
<td>Geogenieing deleted here but discussed later in chapter. The report sees SRM as neither mitigation or adaptation</td>
</tr>
<tr>
<td>18852</td>
<td>7</td>
<td>31</td>
<td>7</td>
<td>36</td>
<td>Retranslate: The AR5 also assessed how climate change interacts with poverty, with ‘poverty’ referring to ‘material circumstances ….. TO THE AR5 also assessed how climate change interacts with poverty. Here the term “poverty” is not limited to material circumstances (such as needs, patterns of deprivation or limited resources), but also economic conditions (e.g. standards of living, inequality, economic situation) …… [Manuela Filuzza, Egypt]</td>
<td>Accepted and text change</td>
</tr>
<tr>
<td>12082</td>
<td>7</td>
<td>33</td>
<td></td>
<td></td>
<td>The 33 mentions social relationships. Social networks are one way of operationalizing social relationships, and the literature on social networks is potentially quite relevant to the report. But this perspective is not really mentioned. One potential reference is Bruijn, Ø. and Phil. C. eds. 2011. Social networks and natural resource management: uncovering the social fabric of environmental governance. Cambridge University Press [Tindal David, Canada]</td>
<td>Rejected: We are summarizing AR5 here which does not use the term social networks in the section we are discussing</td>
</tr>
<tr>
<td>12083</td>
<td>7</td>
<td>36</td>
<td></td>
<td></td>
<td>Interactivity means different things to different authors. It could simply mean the status a person occupies on two different dimensions, and their additive effects. It could also refer to a statistical interaction between two or more status on a particular outcome. [Tindal David, Canada]</td>
<td>Rejected: We are summarizing AR5 so using their terminology is to be consistent</td>
</tr>
<tr>
<td>18716</td>
<td>7</td>
<td>40</td>
<td>7</td>
<td>40</td>
<td>Reference: After IPCC 2014 is 44 - this is a reference format error. [Willem Mutumura, Oka, France]</td>
<td>It is a page number for quote</td>
</tr>
<tr>
<td>1867</td>
<td>7</td>
<td>43</td>
<td></td>
<td></td>
<td>Pls make clear the role of this para in chapter context. [Tibor Farago, Hungary]</td>
<td>Accepted: deleted and short sentence replaces it</td>
</tr>
<tr>
<td>11481</td>
<td>7</td>
<td>43</td>
<td>7</td>
<td>55</td>
<td>Excellent summary. My only concern is that by focussing on where the greatest number of poor people can be found attention is inevitably drawn to the most populous parts of the world, and high concentrations of poor people in less populous parts of the world such as the Pacific are forgotten. [Stewart Lockie, Australia]</td>
<td>Noted: section now deleted and replaced by Figure 5.1</td>
</tr>
<tr>
<td>13034</td>
<td>7</td>
<td>46</td>
<td>7</td>
<td>47</td>
<td>incorporate WBI report Shock Waves: Managing the Impacts of Climate Change and Poverty (2016). [Kwesi Haile, United States of America]</td>
<td>Accepted: deleted and short sentence replaces it</td>
</tr>
<tr>
<td>7536</td>
<td>7</td>
<td>47</td>
<td>7</td>
<td>50</td>
<td>From this sentence it is not clear for which the number of nearly half a billion trapped in chronic poverty applies - is it in 2030? - or perhaps 2018? Please clarify. [Øystein Christofersen, Norway]</td>
<td>Accepted: section now deleted and replaced with figure</td>
</tr>
<tr>
<td>6105</td>
<td>7</td>
<td>48</td>
<td>7</td>
<td>49</td>
<td>Life expectancy usually one word and the sentence needs modifying - 'spilling over into the lives of their children' impacting on the lives of their children with multi-generational implications or similar [Great Britain and Northern Ireland]</td>
<td>Noted: but section now deleted and replaced with figure</td>
</tr>
<tr>
<td>7537</td>
<td>7</td>
<td>49</td>
<td>7</td>
<td>53</td>
<td>Please clarify what 1.25/day corresponds to. Is that the definition of chronic poverty living and where is this definition from? We notice that the SDG 1 mentions $1.90 a day as the international poverty line. [Great Britain and Northern Ireland]</td>
<td>Noted: but this is discussed elsewhere in report (e.g. Chapter 3) and does not really fit in this section of the chapter</td>
</tr>
<tr>
<td>1131</td>
<td>7</td>
<td>50</td>
<td></td>
<td></td>
<td>Consider adding discussion/mention of climatic hotspots. CARISA program has recent literature to offer semi-arid lands in Africa and Asia, as well as Hindu-Kush Himal. Also see de Souza et al (2015) vulnerability to climate change in three hot spots in Africa and Asia. Regional Environmental Change [Bruce Gourley, Canada]</td>
<td>Noted: but this is discussed elsewhere in report (e.g. Chapter 3) and does not really fit in this section of the chapter</td>
</tr>
<tr>
<td>5070</td>
<td>7</td>
<td>53</td>
<td></td>
<td></td>
<td>Hugendahl the inclusion of data on poverty in Latin America from the UNDP Report [ORA WHO DESCRIBS Brazil]</td>
<td>Noted: section now deleted and replaced with figure</td>
</tr>
<tr>
<td>6105</td>
<td>7</td>
<td>53</td>
<td></td>
<td></td>
<td>Thank you. Good point. Sentence added. But some of the discussion on SD has been moved to Chapter 1</td>
<td></td>
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</tbody>
</table>

IPCC WGI SR15 First Order Draft Review Comments And Responses - Chapter 5
Income inequality has also risen in low-income countries and this should also be highlighted here. Income inequality is a global problem and not just an issue in high-income countries.

It is noted that these six paragraphs of the executive summary do not include references to the underlying chapter. It would be very much appreciated if space constraints do not allow for extensive discussion here but we have added several references and reference made to more extensive ethics and justice discussion in Ch1.

This is the first time the MIC acronym has been used so please define. [Wilfran Moufouma Okia, France] Noted: this paragraph has been deleted

Why is Oxfam 2015 not listed in the references if this is the original source of the reference? [Wilfran Moufouma Okia, France] Noted: this paragraph has been deleted

This is the definition of equity in chapter1! Would be useful [Eline Polakczanska, Germany] Noted: this paragraph has been deleted

The term “distributive justice” needs to be explained more fully, especially since it plays such a central role in the UNFCCC regime. In addition to this, there is an enormous literature on climate justice that should be acknowledged. Distributive justice refers to the just distribution of burdens and benefits. In the context that includes - the just distribution of rights to emit greenhouse gases, the just distribution of the costs of mitigation, adaptation and compensation. It also includes the just distribution of the right to extract the remaining permissible fossil fuels. All of this is included in the heading of distributive justice and climate change. [Simon Caney, United Kingdom (of Great Britain and Northern Ireland)]

Two additional references on equity: Holz, Kartha, Athanasiou. 2017. Fairly sharing 1.5C: national fair shares of a 1.5C compliant global mitigation effort. Int Environ Agreements DOI 10.1007/s10784-017-9377-x; Lahn. 2017. In light of equity and science: scientific expertise and climate justice after Paris. Int Environ Agreements DOI 10.1007/s10784-017-9375-8 [Downon Stabinsky, United States of America] Accepted: but more extensive discussion in Chapter 1 and we did not have space to cite more references in this draft.

It is noted that these six paragraphs of the executive summary do not include references to the underlying chapter. It would be very much appreciated if the next draft will also include these references in order to make the report more user friendly [Klaus Radunsky, Austria] Noted: space constraints do not allow for extensive discussion here but we have added several references and reference made to more extensive ethics and justice discussion in Ch1.

If it is noted that these six paragraphs of the executive summary do not include references to the underlying chapter. It would be very much appreciated if the next draft will also include these references in order to make the report more user friendly [Klaus Radunsky, Austria] Noted: this comment refers to exec: summary not section 5.1

It is noted that these six paragraphs of the executive summary do not include references to the underlying chapter. It would be very much appreciated if the next draft will also include these references in order to make the report more user friendly [Klaus Radunsky, Austria] Noted: this comment refers to exec: summary not section 5.1

Do Not Quote, Cite, or Distribute Page 16 of 54
<table>
<thead>
<tr>
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<th>Response</th>
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</thead>
<tbody>
<tr>
<td>18719</td>
<td>8</td>
<td>23</td>
<td>8</td>
<td>28</td>
<td>This section of text reads as if all information has come from Okereke and Coventry (from the beginning of the sentence) but another source is cited at the end of the paragraph. Please clarify which information comes from which source. [Wilhelm Moutsoula Oka, France]</td>
<td>Accepted: clarified and paragraph rewritten</td>
</tr>
<tr>
<td>17392</td>
<td>8</td>
<td>31</td>
<td>8</td>
<td>53</td>
<td>Allocation of CO2 release from shipping is particularly problematic, are the emissions attributed to the ship owner, flagging country or cargo owner? Also the direct and indirect impacts of international and intranational trade flows, relocation of production and resultant pollution, work force migratory patterns and international fisheries also all need to be addressed here. [Green Almght, United Kingdom (of Great Britain and Northern Ireland)]</td>
<td>Rejected: I think this comment refers to a different section as it is not related to the discussion of the SDGs</td>
</tr>
<tr>
<td>1065</td>
<td>8</td>
<td>33</td>
<td>Do you mean the NGO? Be more specific. [Lisa Schipper, Vietnam]</td>
<td>Accepted: sentence rewritten</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12856</td>
<td>8</td>
<td>33</td>
<td>8</td>
<td>33</td>
<td>It would be helpful in section 5.1.3 for the authors to use the four pathway types introduced in chapter 1. This will help the reader draw some final insights.</td>
<td>Updated: paragraph added</td>
</tr>
<tr>
<td>18853</td>
<td>8</td>
<td>33</td>
<td>8</td>
<td>33</td>
<td>Should also the point that unsustainable taken to achieve the other SDG will lead to increased vulnerability to climate change [Carl-Friedrich Schleussner, Germany]</td>
<td>Accepted: changed in text</td>
</tr>
<tr>
<td>1869</td>
<td>8</td>
<td>35</td>
<td>Between 1990 and 1990 to 2015 although they were not declared until 2000</td>
<td>Rejected: the MDGs were from 1990 to 2015 although they were not declared until 2000</td>
<td></td>
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</tr>
<tr>
<td>18720</td>
<td>8</td>
<td>40</td>
<td>8</td>
<td>40</td>
<td>The reference United Nations 2015 is total as a webpage - perhaps the reference used on page 10 lines 17-18 would be more appropriate? [Wilhelm Moutsoula Oka, France]</td>
<td>Rejected: reference updated</td>
</tr>
<tr>
<td>18737</td>
<td>8</td>
<td>40</td>
<td>8</td>
<td>43</td>
<td>The last is good but the sentence is heavy and could be rewritten [Lisa Schipper, Vietnam]</td>
<td>Accepted: phrase deleted</td>
</tr>
<tr>
<td>1870</td>
<td>8</td>
<td>41</td>
<td>8</td>
<td>53</td>
<td>This paragraph could be written as a table or box [Jarno Arthur Pumpa, Brazil]</td>
<td>Noted: but we do refer to the box with more detail in Chapter 1 and felt it important to summarise here</td>
</tr>
<tr>
<td>12696</td>
<td>8</td>
<td>45</td>
<td>8</td>
<td>53</td>
<td>Box 5.1 is about SDGs. It should present the 17 goals and address how the goals of limiting the warming below 1.5C is linkeded to the SDG targets.</td>
<td>Accepted: box redefined as Climate in the SDGs and a box on SDGs can now be found in Chapter 1</td>
</tr>
<tr>
<td>20655</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>The AR5 did not explicitly connect climate change to the development goals then articulated by the UN. Reference: United Nations 2015 - information missing here. [Wilhelm Moutsoula Oka, France]</td>
<td>Accepted: reference date added</td>
</tr>
<tr>
<td>17671</td>
<td>9</td>
<td>1</td>
<td>9</td>
<td>31</td>
<td>Information on advancement of regulations on climate change in different countries will help to understand how the SDG goals particularly SDG 13 are translated in the countries. [Perdita Perdita, Belgium]</td>
<td>Accepted: changed in text</td>
</tr>
<tr>
<td>5745</td>
<td>9</td>
<td>1</td>
<td>9</td>
<td>31</td>
<td>Box 5.1 is about SDGs. It should present the 17 goals and address how the goals of limiting the warming below 1.5C is linkeded to the SDG targets. [Hong Yang, Switzerland]</td>
<td>Accepted: box redefined as Climate in the SDGs and a box on SDGs can now be found in Chapter 1</td>
</tr>
<tr>
<td>1871</td>
<td>9</td>
<td>5</td>
<td>9</td>
<td>5</td>
<td>Development, known as the Sustainable Development Goals. A Development, including the Sustainable Development Goals [planification: that the Agenda is much broader and it is especially essential for the climate change context, including inter alia the paras. 14, 31 or some means of implementation which are discussed in more details from paras. 60] [Tibor Farago, Hungary]</td>
<td>Accepted: phrase deleted</td>
</tr>
<tr>
<td>1872</td>
<td>9</td>
<td>6</td>
<td>9</td>
<td>6</td>
<td>To be met by 2025 to be met by 2020, 2025 or 2030 [explanation: the deadlines is 2020 or 2025 for about twenty targets ] [Tibor Farago, Hungary]</td>
<td>Accepted: changed in text</td>
</tr>
<tr>
<td>1873</td>
<td>9</td>
<td>6</td>
<td>9</td>
<td>6</td>
<td>We were adopted - we were adopted mostly [explanation: there could not be reached agreement on some critical targets in 2012 in the AWG so those paragraphs were 'finalised' only in the 2015 document] [Tibor Farago, Hungary]</td>
<td>Accepted: 2015 deleted</td>
</tr>
<tr>
<td>12559</td>
<td>9</td>
<td>7</td>
<td>9</td>
<td>7</td>
<td>SDGs were not adopted in 2012, but in 2015 by the UN. [Lisa Schipper, Vietnam]</td>
<td>Accepted: text changed</td>
</tr>
<tr>
<td>1874</td>
<td>9</td>
<td>11</td>
<td>9</td>
<td>12</td>
<td>Indivisible package of goals that need to be pursued in an integrated way [Compassant et al. 2016], a indivisible package of goals that need to be pursued in an integrated way [Compassant et al. 2016 UN 2015] [explanation: that the two criteria were already clearly mentioned in the 2030 Agenda '19. 'The SDGs and targets are integrated and indivisible, ... as it would be unfair to those such references'] [Tibor Farago, Hungary]</td>
<td>Noted: but not clear what the comments are asking for</td>
</tr>
<tr>
<td>1875</td>
<td>9</td>
<td>14</td>
<td>9</td>
<td>16</td>
<td>The SDG 13 should be considered together with other provisions of the 2030 Agenda, primarily para 14 and para. 31. actually not the Goal 13 and its set of targets, but only those to which the reference to the hazardous global nature of this process, to the threat posed by climate change and the commitment to accelerate the reduction of global greenhouse gas emissions. Moreover, the climate-related provision of the 2030 Agenda should be taken together with the provisions of the Paris Agreement and this is clearly 'finalised' in the footnote under the Goal 13. Therefore propose (i) to have a more generic title of the Box 5.1: 2030 Agenda and the SDGs (ii) to make references to the above-mentioned parts of the Agenda besides Goal13 (iii) to include a reference to Paris Agreement 'foreseen' by the Agenda [Tibor Farago, Hungary]</td>
<td>Accepted: box redefined and rewritten</td>
</tr>
<tr>
<td>13480</td>
<td>9</td>
<td>14</td>
<td>9</td>
<td>16</td>
<td>Should also the point that unsustainable taken to achieve the other SDG will lead to increased vulnerability to climate change [Carl-Friedrich Schleussner, Germany]</td>
<td>Noted</td>
</tr>
<tr>
<td>9721</td>
<td>9</td>
<td>15</td>
<td>9</td>
<td>15</td>
<td>Goal 13 is indeed important, but all the 17 goals of the SDGs are important and interrelated with each other. That is, I suggest to replace: the major threat by &quot;one of the major threats to.. &quot; [Kai Fang, China]</td>
<td>Accepted: text changed</td>
</tr>
<tr>
<td>1876</td>
<td>9</td>
<td>19</td>
<td>Implementing the UNFCCC goal of $100b annually for a implementing the climate finance goal of $100b annually from 2020 for (explanation: this quantitative political commitment was not in the 1992 UNFCCC but first appeared in the 2009 Copenhagen Accord and was universally approved within the 2020 Agenda and the 2015: Paris Decision I [Tibor Farago, Hungary]</td>
<td>Accepted: text added and more detailed info now in Box 1876</td>
<td></td>
<td></td>
</tr>
<tr>
<td>789</td>
<td>9</td>
<td>21</td>
<td>9</td>
<td>21</td>
<td>Not sure what it means in the citation or is it a citation? [Minhyun Kim, United Kingdom (of Great Britain and Northern Ireland)]</td>
<td>Noted</td>
</tr>
<tr>
<td>6110</td>
<td>9</td>
<td>27</td>
<td>9</td>
<td>27</td>
<td>What fundamental transformations? This is defined later in the page (from line 43) - so perhaps the box could be moved, or the definition referenced to from the box? [Ben Jeadjin, United Kingdom (of Great Britain and Northern Ireland)]</td>
<td>Accepted: clarified in text</td>
</tr>
<tr>
<td>1877</td>
<td>9</td>
<td>30</td>
<td>9</td>
<td>30</td>
<td>'Non-quantiative targets' (5CB2 2017), 'a non-quantiative targets' (SCRD 2017) some more concrete provisions were proposed by the Paris Agreement adopted after the approval of the SDGs. (explanation: it was made clear in the text of the 2030 Agenda (para. 32 and footnote to SDG13) that there were ongoing climate negotiations and it was assumed that more concrete provisions would complement the rather 'soft' SDG13-related targets, so in spirit of fairness, a reference is needed to the PA). [Tibor Farago, Hungary]</td>
<td>Noted: we have added text on Paris agreement, but it contains little in the way of quant targets other than 2 and 1.5</td>
</tr>
</tbody>
</table>
I object to the conflation of resilience and adaptation. Transformation is merely one of several aspects of socioeconomic adaptation. Resilience and adaptation have the potential for both conflicting/synergistic relationships across multiple axes. This lack of definition blinds the parties examining the explore of empirical evidence cited. The theory is not well received among disaster, engineering, community resilience, ecological, and urban resilience. As such, advances in methodology have been equally dispersed. Davidson, J., Jacobson, C., Lyth, A., Dedekouten-Hovea, A., Bavinck, C., Ellison, J., Holbrook, N., Howes, M., Sarma-Neumann, S., Singh-Peterson, L., & Smith T (2016). Interrogating resilience: Toward a typology to improve its operationalization (Ecology and Society, 21(2), Art. 27. Retrieved from http://www.ecologyandsociety.org/vol21/iss2/art27). Meeser, S., Newell, J.P., & StuA (2016). Defining Urban Resilience: A Review, Landscape and Urban Planning, 147, 38-49. The argument assumes that climate-resilient pathways are somehow different from resilience. This conflation of resilience and transformation (as cited in Pelling, et al. 2015) is likely to confuse readers. My recommendation is to stick with transformational adaptation, disaster resilience (single-equilibrium variant used in the IPCC), community resilience (multi-equilibrium variant utilized in climate-resilient development pathways) and adaptation pathways. [Jesse Keenan, United States of America]

1095 9 94 9 50

Comment No From Page From Line To Page To Line

18723 9 41 9 41
Reference: After Denton et al there is 1122 - this is a reference formal error. [Mina Movahheda Otsa, France]

Noted: but if it is a reference to a page number, it has been deleted

18724 9 41 9 45
Reference: After Denton et al there is 1122 - this is a reference formal error. [Mina Movahheda Otsa, France]

Noted: 2nd. It is a reference to a page number. It has been deleted

18748 9 44 9 45
Concept of transformation implies fundamental changes in natural and human systems including changes in values, institutions, technologies, and biological systems. *(explanation: more careful language would be needed in order to avoid any confusing correlation concerning the voluntary interference with the natural systems, biological systems)* [Tibor Farago, Hungary] Noted

2813 9 46
Please change Faxy et al. 2017 to Faxy et al., 2016 [Tymon Zielinski, Poland]

Rejected. It is a reference to 2017 published paper in Climate and Development

12660 10 7 10 15
This figure looks nice, although the orange circle is not defined. And what is 46 the lying to show? That climate resilient development pathways are all the same centre of the chart. Can the climate resilient development pathways need to take all the SDG in account? It is too bossy - maybe the problem lies in the arrows - what does there need to be a direction? [Lisa Schipper, Vietnam]

Accepted and changed

6465 10 9 10
It is difficult to understand Figure 5.1. Why the upper arrows show synergies and the lower arrow shows trade-offs? It looks like the Goals above 13 have more synergies than the Goals below 13. The achieving Goal 13 serves to achieve Goal 4 and 5. It is my first impression. [Makiko Kanama, Japan]

The figure is no longer in this section. A simpler version is in FAO2

13363 10 9 10
This figure packs a lot of information and is may be difficult for readers to make sense of all the inter-connected parts in a logical order. Considerations to enhance communicability include - what is the key message? Could it be more clearly highlighted in text in the figure (e.g. heading/sub-heading)? SDG icons are small, difficult to read, and so rely on the reader already being familiar with these icon and what they represent. (see 5.7) should be written (Section 5.7) [Timo Niuwakika Otsa, France]

Accepted: See beginning of section 5.1.3

2804 10 12
Figure 5.1. In my opinion the figure is too "busy". The concept is very difficult to follow, especially, since the SDG concept is always presented in a very easy and clear form. I suggest changing the figure. [Tymon Zielinski, Poland]

The figure is no longer in this section. A simpler version is in FAO2

9735 10 12 10 15
Figure 5.1 A conceptual illustration of climate-resilient development pathways. After all, is a new concept, and I think climate-resilient development pathways should be explained in more words. [Forging Sun, China]

The figure is no longer in this section. A simpler version is in FAO2

1880 10 17 10 18
The UN resolution which adopted the SDGs has the title 'Transforming Our World: the 2030 Agenda for Sustainable Development' and highlights the need to address 'the root causes...', not merely their symptoms' (UNRISD 2016: 3); this entails.. (explanation: the resolution A/RES/70/1 is on the adoption of the Agenda which includes the SDGs besides many other provisions; the quotation the root causes... is not part of that resolution or the Agenda...)) [Tibor Farago, Hungary]

The figure is no longer in this section. A simpler version is in FAO2

7399 10 17 10 18
Delete the text: It has been "Transforming Our World: the 2030 Agenda for Sustainable Development" and it is a resolution. [Evel Kaalis, Austria]

The figure is no longer in this section. A simpler version is in FAO2

18726 10 20 10 21
Reference: After UNRISD 2016 is 3; this is a reference formal error. [Mina Movahheda Otsa, France]

The figure is no longer in this section. A simpler version is in FAO2

7370 10 20 10 24
Delete the text: It stresses the challenge of pursuing sustainable human development against the backdrop of increasing global inequality, future climate change, and current environmental damage (Freundlich and Blanchet 2013). Climate-resilient development pathways can help meet these challenges,* it also research implemented prior to the adoption of the 2030 Agenda. [Evel Kaalis, Austria]

The figure is no longer in this section. A simpler version is in FAO2

2805 10 23

The figure is no longer in this section. A simpler version is in FAO2

12651 10 28 10 29
This sentence needs some editing help: Not clear what is meant by not experienced as such on the ground [Lisa Schipper, Vietnam]

Sentence no longer in section

1891 10 29
SDG13 will have a different structure in my final comment and SDG5 which seems to be more logical and possibly more understandable for 'outsiders' [Tibor Farago, Hungary]

Noted: we now briefly discuss pathway 1 to 1D including overshoot in 5.1.3

1892 10 29
to make 1.5°C warmer world for [Tibor Farago, Hungary]

Accepted: revised

6111 10 29 10 29
Is the word 'world' missing here before for poverty? [Heid Janfost, United Kingdom of Great Britain and Northern Ireland]

Accepted: revised

12662 10 32 10 33
Maybe worth noting that in general, there is quite a lot known about the impacts of climate change on these issues, but where knowledge is limited is specifically with respect to 13. [Lisa Schipper, Vietnam]

Noted: this is a challenge for the whole report

12663 10 34 10 41
This sentence contains too many vague references to ideas 'invisible', 'visible', and the phrase 'intersection of systemic inequalities and multi-dimensional vulnerabilities along the axes of gender, class, ethnicity, race, and (dis)ability, marginalisation and deprivation, and social inclusion and exclusion that are exacerbated by uneven development patterns' is too heavy and unclear. [Lisa Schipper, Vietnam]

Noted: new drafted

12712 11
To make 1.5°C warmer world for... [Tibor Farago, Hungary]

Accepted: revised

More literature has been included about roles on poor beyond food price, wealth, including hunger income losses, labor productivity, and displacements, for instance from heat stress and other extreme events, malaria, sea level rise and lost livelihoods opportunities.
The chapter does not make reference to including grey literature - which is included in chapter 1. [Tara Shine, Ireland] Accepted: added

Authors should use extreme caution when using “interpolation” to refer to impacts at 1.5 degrees. The topic of the special report is on global warming of 1.5°C, hence all evidence presented in this report should be based upon that information. Where information is not available, the authors should note the gap, but not speculate beyond what could be drawn from the scientific literature. Drawing conclusions on the basis of speculation or interpolation may compromise the integrity of the IPCC. [Ferhat Achleitner, United States of America]

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The percentage change of vegetation is the most expensive - is this even worth including? It doesn't say anything really. [Lea Schipper, Vietnam] Accepted - removed from the text.

These numbers are based on the cited assessment by Hallegatte and Rozenberg (2017), compatible with 1.5°C by the end of the century (confirmed by 1st author).

Accepted - thank you.

We now include a reference to WHO on undernutrition. More health impacts, incl. undernutrition, are discussed in Ch 3 with focus on global and regional findings/projectors.

We have discussed it with Ch 1 and CH2 for consistency of differendal statements of 1.5 and 2°C. We will develop more the discussion on overshoot in the final draft, if more literature on this issue becomes available.

This section is really insightful and very useful. Please consider writing some more text in this section, related to Figure 5.2. [Sigrid Kusch, Germany] Thank you. More text has been added.

The graphic has been modified to show ranges of possible avoided impacts, not a comparison.

The text has been modified, proxy and expert judgement dressed, and the graphic no longer shows a comparison but examples of possible risks reduced under the 2 temperature levels.

The figure should separate chapters if not comparable [Piers Forster, United Kingdom (of Great Britain and Northern Ireland)]

The figure should separate chapters if not comparable [Piers Forster, United Kingdom (of Great Britain and Northern Ireland)]

This section is entitled Risks of a 1.5 degree warmer world, are the numbers in this figure related to global warming of 1.5 degrees? [Wilfran Moufouma-Okia, France] We have inserted Dasgupta et al at 2014 as reference for artisanal fisheries.

We have included these differential prospects with implications to poor coastal people and livelihoods, with additional cross referencing to Ch 3.

The test has been modified, proxy and expert judgement dressed, and the graphic no longer shows a comparison but examples of possible risks reduced under the 2 temperature levels.

The graphic has been modified to show ranges of possible avoided impacts, not a comparison.

Many thanks for the reference provided.

Figure 5.2 is useful in describing different types of impacts but I think it's too tenuous to include as a graph in this manner. In particular, the distinctions between 1.5 and 2°C impacts are largely arbitrary, even if based on expert elicitation. The nature of the graph gives the impression that the information presented would be updated in a timely manner. [Jordan Harold, United Kingdom (of Great Britain and Northern Ireland)]

The graphic has been modified to show ranges of possible avoided impacts, not a comparison.

The test has been modified, proxy and expert judgement dressed, and the graphic no longer shows a comparison but examples of possible risks reduced under the 2 temperature levels.

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The graphic has been modified to show ranges of possible avoided impacts, not a comparison.

The graphic has been modified to show ranges of possible avoided impacts (sliding back)”, not a comparison.

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The graphic has been modified to show ranges of possible avoided impacts (sliding back)”, not a comparison.
This section needs more references. [Lisa Schipper, Vietnam] Addressed. Details and References added as relevant

Delete the text "and lock-ins". [Eleni Kaditi, Austria] This text has been modified and 'lock-in' removed.

Provided that there are sufficient evidence for this statement, we suggest that this vital conclusion should be included in the Executive Summary. [Øyvind Christophersen, Norway]

Both references used here focus only on oil palm, can other references highlighting other examples of local community adaptive capacity? [Wilfran Moufouma Okia, France]

Please change wellbeing into well-being [TYMON ZIELIÅSKI, Poland] Accepted - Thank you.

Nothing new is added to the discussion on the theme "Impact of adaptation on sustainable development" a more detailed analysis on the theme is (see 5.4.2) ... (see 5.6) should be written (Section 5.4.2) ... (Section 5.6) [Wilfran Moufouma Okia, France] Accepted - Thank you.

More than limiting temperature rise, adaptation will help in adjusting to present and expected changes in temperature. [Himangana Gupta, India] Addressed. Text edited

It might be helpful to revise to say that certain adaptations at one scale to one group may be maladaptive to others at another scale. [Jesse Keenan, USA] Addressed: Text revised and new literature added to Section 5.3

Is the use of # instead of number correct in such a prestigious report? [Moshe Kinn, United Kingdom (of Great Britain and Northern Ireland)] We have changed it to numbers.

It would be helpful in section 5.3 for the authors to use the four pathway types introduced in chapter 1. This will help the reader draw some final insights as well as the reader to draw some final insights into suitable timings and the financial viability of investments (Sietz et al. 2017). ---- Reference: Sietz, D., Fleskens, L. and Stringer, LC. (2017) Learning from non-linear ecosystem dynamics is vital for achieving Land Degradation Neutrality. Land Degradation and Development. Online First. DOI: 10.1002/ldr.2722. http://onlinelibrary.wiley.com/doi/10.1002/ldr.2722/full [Diana Sietz, Netherlands] Noted. We did not have space for such detail which in any case is more relevant to Chapter 4

For a unified format, there are three ‘,’ in parentheses redundant that should be deleted. [Kat Fang, China] Done

This sentence is difficult to comprehend and seems to be not in line with the rest of the report. Mitigation actions are needed to limit global warming, but we are not sure whether adaptation has a potential to limit warming to 1.5ºC. Adaptation will for sure limit the impacts of warming. However, this section does not describe how adaptation measures can limit global warming, but how adaptation could impact on sustainable development. [Øyvind Christophersen, Norway]

This sentence appears to confound adaptation and mitigation. Adaptation stated to have a role to "limit warming". Usually effort to limit warming is seen as mitigation, while adaptation is human response to a warming world. Possibly the authors wish to highlight the mitigation potential of adaptation actions so far, as the title would provide clarity. [Bruce Currie-Aller, Canada] Addressed: Text edited

The principle of intergenerational equity (Eq), the right to the future and the rights of future generations (human and non-human species, principle of intergenerational justice) must be deeply analyzed considering the implications of global sustainability policies and adaptation policies in a contest of climate crisis. [Enric Pàgacs, Peru] Addressed: Added references.

For a unified format, there are three ‘,’ in parentheses redundant that should be deleted. [Kat Fang, China] Done

I think 5.3 and 5.4 are very important and well written. The SDGs are shown as way to structure most of the insights, which is a reasonable decision. However, the specific synergies and trade-offs are not systematically reviewed. It would have been good if there is an in-depth review on synergies and trade-offs between climate mitigation and SDGs that represents the complete body of literature, but that seems to late for now. A crosswalk between mitigation and adaptation trade-offs could help where as much literature as possible goes in towards systematic evaluation (plus/minus/reverse). In addition, coordinate with the text on p.2718R that also goes into this direction. [Felix Creutzig, Germany] Addressed: Text revised and new literature added to Section 5.3

This sentence needs to be considerably developed. Discussion of synergies between adaptation response options and sustainable development is given less than half the space as the discussion of synergies between mitigation and sustainable development. Adaptation strategies such as integrating disaster risk reduction and climate change adaptation, ecosystem conservation, community-based adaptation and livelihoods also offer SD benefits and should be included. [Carl-Friedrich Schuaschaer, Germany] Addressed: Text revised substantially.

Is the use of # instead of number correct in such a prestigious report? [Moshe Kinn, United Kingdom (of Great Britain and Northern Ireland)] We have changed it to numbers.

I think you need to be careful when you speak about cultural-based adaptation - it is not a synonym for adaptation of indigenous people. What exactly is the principle of intergenerational equity (Eq)? The right to the future and the rights of future generations (human and non-human species, principle of intergenerational justice) must be deeply analyzed considering the implications of global sustainability policies and adaptation policies in a contest of climate crisis. [Enric Pàgacs, Peru] Addressed: Added references.

Please change wellbeing into well-being [TYMON ZIELIÅSKI, Poland] Accepted - Thank you.

For a unified format, there are three ‘,’ in parentheses redundant that should be deleted. [Kat Fang, China] Done

The path way close chapter box located in CH 1 has been further modified. Section 5.3 refers to adaptation pathways. Other pathways are used in other sections of the chapter.

This section needs more references. [Lisa Schipper, Vietnam] Addressed. Details and References added as relevant

Nothing new is added to the discussion on the theme "Impact of adaptation on sustainable development" a more detailed analysis on the theme is needed with an innovative approach. The text in its current state is of very low quality. [Julio-Morl Desayi Ramon, Mexico] Text and structure revised.

This sentence is difficult to comprehend and seems to be not in line with the rest of the report. Mitigation actions are needed to limit global warming, but we are not sure whether adaptation has a potential to limit warming to 1.5ºC. Adaptation will for sure limit the impacts of warming. However, this section does not describe how adaptation measures can limit global warming, but how adaptation could impact on sustainable development. [Øyvind Christophersen, Norway] Addressed: Text revised and new literature added to Section 5.3

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This section needs to be considerably developed. Discussion of synergies between adaptation response options and sustainable development is given less than half the space as the discussion of synergies between mitigation and sustainable development. Adaptation strategies such as integrating disaster risk reduction and climate change adaptation, ecosystem conservation, community-based adaptation and livelihoods also offer SD benefits and should be included. [Carl-Friedrich Schuaschaer, Germany] Addressed: Text revised substantially.

These are the last changes applied. [Raja Shaha, India]
Community-based adaptation, particularly with a strong gender lens, by virtue of its more participatory approach can also address inequalities at a local level, providing synergies or SDG2/5. Incidentally, CBAs also reflect several of the principles for good adaptation captured in Art 7 of the Paris Agreement. It's worth discussing integrating the importance of the HCDV adaptation is implemented (i.e. the governance aspect, participatory nature, etc.) as an area for research, though not sufficiently an element of capturing synergies between adaptation and SD. This is an opportunity to refer back to the need for a good rights framework and the importance of process as much as outcome in achieving climate results and SD results. See Managing Uncertainty: An Economic Evaluation of Community-based Adaptation in Niger (NEF Consulting, 2014) at http://www.netnef.com/Managing-uncertainty.pdf [Tonya Rawe, United States of America]

Text in Section 5.3.1 has been revised substantially.

Text: Synergies between Adaptation Response Options and Sustainable Development and Trade-offs between Adaptation Response Options and Sustainable Development. As with the climate mitigation part, climate adaptation should also be divided into several parts, and the relationship between these and sustainable development should be discussed. [Yangsung Sun, China]

Addressed: Structure review revised.

If you want to say, provide some references. However, I would argue that what we know is that Adaptation IN THEORY has links with sustainable development, but in reality we don't know much since most implemented adaptation is recent and has a short-term vision. Consider the next section, which says that there are some costs. [Lisa Schipper, Vietnam]

Noted. Section has been substantially rewritten.

It is important to do that to enhance ecosystem-based adaptation, the management of the interaction between climate change and biodiversity governance including the links between UNCCD and CBD is important. See Morita, Kanako and Ken'ichi Matsumoto. (2015) “Enhancing Biodiversity Co-benefits of Adaptation to Climate Change” In Walter Leal Filho (ed) Sustainable Development, As with the climate mitigation part, climate adaptation should also be divided into several parts, and the relationship between these and sustainable development should be discussed. [Tonya Rawe, United States of America]

We did add sentence on plus and minus of climate smart agriculture

The importance of biodiversity has been flagged in the EBA discussion. We have incorporated this reference - thank you.

Reference: Lipper and Al - this reference is listed twice in the reference list at the end of the chapter as Lipper et al and Lipper and Al. [Wilfran Zinka, United Kingdom (of Great Britain and Northern Ireland)]

Done.

A key to achieving EBA is better acknowledgement of the close relationship between climate and non-linear ecosystem dynamics. This provides critical insights into what to invest, climate-dependent windows of opportunities and risks, and the financial feasibility of interventions (Siat et al. 2017). These insights are pre-requirements for cost-effective and efficient EBA actions. — Reference: Siat, D., Flenau, L., and Stringer, LC. (2017) Learning from non-linear ecosystem dynamics is vital for achieving Land Degradation Neutrality. Land Degradation and Development. Online First. DOI: 10.1002/ldr.2732 http://onlinelibrary.wiley.com/doi/10.1002/ldr.2732/full [Diana Siat, Netherlands]

The Section discusses EBA in a specific context. Incorporation of this level of detail is unfortunately beyond its scope. It does fit better in Ch 4.

Do Not Quote, Cite, or Distribute Page 22 of 54

No, it's not the first time the abbreviation 'SD' appears in Chapter 5, so I have recommended to provide its full name. [Xia Fong, China]

Unfortunately beyond scope of this section

There is lesser acceptance of the PES concept as there are no payments for services. Options for overcoming difficulties in implementing adaptation measures could be given. [Himangana Gupta, India]

Addressed/included.

Unfortunately beyond scope of this section

Two briefs for references which could be made a single set of briefs. [Reid Zanka, United Kingdom (of Great Britain and Northern Ireland)]

Addressed/included.
Comment | From Page | From Line | To Page | To Line | Comment | Response | Note
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5078 | 15 | 23 | 15 | 29 | The literature is adequate to treat PSA; however, this is an issue because there are several researches in progress aiming to justify the ecosystem services of cultivated pastures, monocultures of giant bamboo, for example, the scientific recognition of these works can be the basis for the appropriation of territories used by native communities. [CRISTIANO DESCONSI, Brazil] | Noted. But it would help to provide published paper references.
792 | 15 | 25 | 25 | 25 | It can't be Chapter 4 and box 3.2, needs either chapter or box number changed [Mithra Kim, United Kingdom (of Great Britain and Northern Ireland)] | Corrected
1976 | 15 | 32 | 15 | 32 | Section on trade-offs. Need to consider the risks posed to human rights by adaptation: E.g. when communities are not consulted, when the risks to information or participation is denied. Explore the gender dimensions of these provisions as well. [Tara Shine, Ireland] | Test added on rights
17973 | 15 | 32 | 16 | 29 | A summary of challenges for the trade-offs will help to understand what should be put in actions. Some discussions have been made in page 31. [Hermin Purdhe, Indonesia] | Noted
17974 | 15 | 32 | 16 | 29 | This section brings up negative dimensions of adaptation. I think it would be more useful to combine the positive and negative for each sector. It would give each point more context. [Lisa Schipper, Vietnam] | Addressed
18738 | 15 | 35 | 15 | 35 | Text in SPM IN IPCC 2016 - it should be made clearer that is is within the stated reference, not the SPM of this report. [Wilfrid Moufouma Okia, Cameroon] | Addressed
12673 | 15 | 37 | 15 | 37 | Instead of citing another AR5 chapter here, you could cite Magano at al. 2016 on maladaptation. [Lisa Schipper, Vietnam] | Done. Thank you
12714 | 15 | 49 | 15 | 51 | This sentence is obliquely phrased [John Barton, United Kingdom (of Great Britain and Northern Ireland)] | Addressed
7943 | 16 | 5 | 16 | 7 | Please consider to clarify or rephrase to better communicate what "trade social outcomes for market-based business models risk perpetuating inequality and injustices" actually mean? [Oyvind Christophersen, Norway] | Text edited
12676 | 16 | 16 | 16 | 16 | Are you using traditional cultural adaptation as it is in psychology? If not, you need to explain what it means. Also, the list of reasons that it is diminishing seems a bit random - what about globalisation, and, indeed, environmental change? [Lisa Schipper, Vietnam] | We no longer use this term. We now say 'traditional knowledge-based adaptation'.
6116 | 16 | 11 | 16 | 11 | A support for being increasingly less resilient? [Perdinan Perdinan, Indonesia] | Addressed / edited
7944 | 16 | 14 | 16 | 18 | We would believe that "global expansion of biofuels" was a mitigation response, and not an adaptation response? Please consider to clarify. [Oyvind Christophersen, Norway] | Addressed
7739 | 16 | 20 | 16 | 29 | Could use a line describing what adaptation deficit means (Ann Par Tony, United States of America) | Addressed
12677 | 16 | 20 | 16 | 29 | This section is unclear. Maybe you should also talk about the development deficit here - is adaptation supposed to address development gap? There is certainly discussion on this, and the best of it from the early 2000s (especially Jan Burton). It may seem outdated now, but it is still very relevant to the points here [Lisa Schipper, Vietnam] | Test substantially revised to reflect relationship between adaptation and development in 5.3.1
6117 | 16 | 26 | 16 | 28 | A sentence that is saying that adaptive efforts to protect from flooding would undermine household coping capacity. I think this may need to be rephrased. [Perdinan Perdinan, United Kingdom (of Great Britain and Northern Ireland)] | Text edited
12678 | 16 | 35 | 16 | 35 | I think you need to be careful about lumping sustainable development together with the SDGs, and make sure you mean the one that you are using. [Lisa Schipper, Vietnam] | Test revised in 5.1 and 5.3
12679 | 16 | 40 | 16 | 43 | This is too vague and non-specific, or it needs better punctuation, but hard to follow. [Lisa Schipper, Vietnam] | Text on migration. Climate change as well as rights have been added.
19788 | 16 | 51 | 16 | 53 | Adaptation actions can lead to inequities and conflict when rights are not taken into account - are risks to cultural rights and right to self determination associated with migration, displacement and relocation. The wider literature on migration, displacement and climate change is relevant here. [Tara Shine, Ireland] | The sentence has been simplified and a link to the cross-chapter box on pathways added, where adaptation pathways are described.
1608 | 16 | 51 | 16 | 53 | The claim to lock-in and poverty traps is specific to resilience and not necessarily adaptation. This is worth nothing doing. The antecedent to this sentence is not adaptation (see line 40). The literature cited is speaking to both adaptation and resilience. Overall, this is a very important citation and I commend the authors for their recognition of this challenge [Jasmin Keenan, United States of America] | A poverty trap is an example of a lock-in. The term lock-in is certainly used outside of the resilience literature, e.g. carbon lock-in (see 5.6). It refers to inertia and path dependencies.
7372 | 16 | 52 | 16 | 52 | Box 24: Resource efficiency is crucial in terms of both climate change and sustainable development. Therefore, some implementations and solutions for providing resource efficiency and reducing environmental pressure such as decoupling should be given in detail in this section. This can contribute to the global dissemination of decoupling practices, which are now considered to be necessary. [Razan M., Turkey] | The term lock-in has been removed.
10227 | 17 | 17 | 17 | 17 | Section 5.4 has redundancies with chapter 4 (coordinating would help reduce these, such as sections 5.5 and 5.6 with 4.3 and section 4.4. [Rick Warner, Germany] | Taken into account. 5.4 restructured. Test in 5.9 revised. 5.5 merged with 5.6 and 5.8 edited.
20857 | 17 | 24 | 17 | 24 | Section 5.4 should also include an analysis of impacts of SD on mitigation and not just imply that impacts are on mitigation options on SD, that is, there are synergies and trade-offs both ways. [Jason Lee, Guatemala] | Taken into account. Restructuring has been done. The current section 5.4 integrates relevant text.
20877 | 17 | 25 | 17 | 25 | Text substantially reworked to reflect relationship between adaptation and development in 5.3.1 | Noted. The section deals with SD implications of various mitigation options including resource efficiency enhancing options. Also see chapter 4.
11462 | 17 | 22 | 17 | 22 | Don't edit Figure 5.1 [Silvan Knudt, Sweden] | The figure has been removed.
13367 | 17 | 1 | 17 | 5 | Figure 5.3: In right hand panel, unclear what the light blue dashed arrows represent. Also unclear what the dashed decision point aligned with 'present' and placed in the inset 'unattractive space' represents. Suggest additional explanation in the figure. [Jordan Factors, United Kingdom (of Great Britain and Northern Ireland)] | Noted. The section deals with SD implications of various mitigation options including resource efficiency enhancing options. Also see chapter 4.
12680 | 17 | 1 | 17 | 5 | Figure 5.3 is also difficult to understand and requires explanation. Are the decision points decisions about adaptation? Or development decisions? [Lisa Schipper, Vietnam] | The figure has been removed.
9148 | 17 | 1 | 17 | 5 | Figure 5.5 needs more clarity and discussion to be intelligible [Mohamed Elsharouny, Egypt] | The figure has been removed.
13485 | 17 | 5 | 17 | 5 | Figure 5.3 is not particularly enlightening and the point of adaptation pathways is made much more clearly in the actual test. This figure should either be revised to be more informative or deleted. [Crist-Fredrich Schlesinger, Germany] | The figure has been removed.
9723 | 17 | 17 | 17 | 5 | There is a '2' in parentheses referred to that should be deleted [Kai Fan, China] | Noted. Minor edit. Addressed
12681 | 17 | 27 | 17 | 27 | This is good [Lisa Schipper, Vietnam] | The figure has been removed.
14145 | 17 | 7 | 17 | 7 | Rumania: I [Elvir Poloczanska, Germany] | Noted. Minor edit. Addressed
14146 | 17 | 19 | 17 | 19 | Lebanon: I, one of the other Lebanon's [Elvir Poloczanska, Germany] | Noted. Minor edit. Addressed
7740 | 17 | 27 | 17 | 27 | Poverty Eradication and not Poverty elimination [Ann Par Tony, United States of America] | Noted. Minor edit. Addressed
IPCC WGI SR15 First Order Draft Review Comments And Responses - Chapter 5

Comment No | From Page | From Line | To Page | To Line | Comment | Response
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1970 | 17 | 44 | 17 | 45 | Corrective measures can include the integration of human rights and gender equality into all climate actions. (Tara Shine, Ireland) Taken into account. Text revised to include reference.

1700 | 18 | 20 |  |  | However, if the tax is 'inappropriate', with too much procedurally recycled to the non-governmental economy, these negative effects appear to be offset [22]. But this would require a substantial global commitment to such a scheme, and would require governments to resist the temptation to use tax revenues for other purposes; some governments so far have a spotty record honouring such commitments (cf. the UK Climate Change Levy (CCL)). Bottom line is: I offer the thought that SR1.5 guidance to suppress rebound should be qualified by the caution that such policies could reduce the capacity to meet other SDG goals, especially for developing countries where energy demand is well below saturation levels [3,4,5]. It may even be better to forego advising such rebound mitigation policies in the context of the SR1.5 comprehensive framework, at least for developing countries. [HARRY SAUNDERS, United States of America] Taken into account. Also in connection with #420. Text appropriately revised, included in table S.1 in appropriate cell. Added new literature, avoided most of the old literature.

1701 | 18 | 20 |  |  | References Cited
4. Checkoway D, Diapaltis S, Roy J. (2015). "Rebound effect: how much to worry?" Current Opinion in Environmental Sustainability 5(2): 216-226. [Large but varying rebound measured; rebound effects in developing countries likely to be higher than industrialized countries; rebound mitigation policy may not be appropriate for developing countries]

18797 | 18 | 5 | 20 | 25 | Section 5.4.1 on synergies between mitigation options and sustainable development should address the sustainable development benefits of reducing short-lived climate pollutants. See, for example, Sprangmann already cited in Chapter 4 of the 1.5C Special Report. [David Waskow, United States of America] Accepted. A new cities box is included in the SOD. Also check Ch. 4. Also some new text added in the section in revised version.

18796 | 18 | 5 | 20 | 25 | Section 5.4.1 on synergies between mitigation options and sustainable development should address the sustainable development benefits of reducing short-lived climate pollutants. See, for example, Sprangmann already cited in Chapter 4 of the 1.5C Special Report. [David Waskow, United States of America] Accepted. A new cities box is included in the SOD. Also check Ch. 4. Also some new text added in the section in revised version.

18831 | 18 | 5 | 20 | 25 | Section 5.4.1 on synergies between mitigation options and sustainable development should address the sustainable development benefits of reducing short-lived climate pollutants. See, for example, Sprangmann already cited in Chapter 4 of the 1.5C Special Report. [David Waskow, United States of America] Accepted. A new cities box is included in the SOD. Also check Ch. 4. Also some new text added in the section in revised version.

18832 | 18 | 5 | 20 | 25 | Section 5.4.1 on synergies between mitigation options and sustainable development should address the sustainable development benefits of reducing short-lived climate pollutants. See, for example, Sprangmann already cited in Chapter 4 of the 1.5C Special Report. [David Waskow, United States of America] Accepted. A new cities box is included in the SOD. Also check Ch. 4. Also some new text added in the section in revised version.

6387 | 18 | 8 | 18 | 8 | AFOLU - Agriculture, Forestry and Other Land Use (Jose Arthur Pimentel Pereira; Brazil) Accepted. Text revised

18739 | 18 | 13 | 18 | 15 | With references are these statements based on? Please list refs of the literature that show the ‘high agreement’ (Withan Mudoomu Osku, France) Taken into account. Text deleted as the statement is no longer relevant in the section.

12087 | 18 | 15 | 18 | 15 | "significant" should be "significant" (Tindal, David, Canada) Accepted. Text revised

1149 | 18 | 16 | 18 | 15 | Spelling mistake: "significant" (Bruce Curre-Allder, Canada) Accepted. Text revised

14140 | 18 | 20 | 18 | 21 | Why pursing mitigation options independently can lead to loss of backdoors, needs further explanation. [Evina Pociunas, Germany] Accepted. Text revised
Comment No | From Page | From Line | To Page | To Line | Comment | Response
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17350 | 18 | 24 | 18 | 27 | Six-Aviation and International Shipping are not improving efficiency of the rate at all. In shipping recent study by CE Delft found that ships built in to day are less efficient that those built in the 1980s, by some measures. The ENVI study looks into account the ICM's own research which found that shipping GHG emissions are projected to grow by between 90% & 25% by 2030. Shipping could be responsible for up to 17% of global CO2 emissions in 2050 if left un regulated and along with Aviation could amount to 40% of total emissions. | Rejected. The revised draft deleted the specific row.
18740 | 18 | 26 | 18 | 33 | Are all these statements from Lucon et al 2014? If not, please cite additional references where this information has come from. If so, please cite reference again to make this clear. | Accepted. Additional references added.
7127 | 18 | 26 | 18 | 30 | On "local employment": A recent study in Sweden, identifies the limited workmanship/space (e.g. only 2% of the existing heated floor area can be renovated per year), as key constraint for increased renovation rates, which can be interpreted as that high renovation rates in line with the 3% goal within the 1.5C pathway will still pose a positive effect in employment (Mata E., Saak, Kakagoudas A., Johnson F. Energy savings and CO2 emission reductions from building retrofitting in five European countries – Modelling and review of estimates (in review)). | Taken into account. Covered in the section 5.4.1.1
15419 | 19 | 28 | 19 | 35 | Mobility is the sentence "Clean cook-stoves enhance indoor air quality" to "Clean cook-stoves enhance indoor air quality", [Francisco Javier Hurtado Albiir, Germany] | Noted. We keep the sentence unchanged to make it even broader than suggested.
13486 | 18 | 32 | 18 | 33 | On "local employment": A recent study in Sweden, identifies the limited workmanship/space (e.g. only 2% of the existing heated floor area can be renovated per year), as key constraint for increased renovation rates, which can be interpreted as that high renovation rates in line with the 3% goal within the 1.5°C pathway will still pose a positive effect in employment (Mata E., Saak, Kakagoudas A., Johnson F. Energy savings and CO2 emission reductions from building retrofitting in five European countries – Modelling and review of estimates (in review)). | Taken into account and included.
15420 | 18 | 38 | 18 | 38 | On "local employment": A recent study in Sweden, identifies the limited workmanship/space (e.g. only 2% of the existing heated floor area can be renovated per year), as key constraint for increased renovation rates, which can be interpreted as that high renovation rates in line with the 3% goal within the 1.5°C pathway will still pose a positive effect in employment (Mata E., Saak, Kakagoudas A., Johnson F. Energy savings and CO2 emission reductions from building retrofitting in five European countries – Modelling and review of estimates (in review)). | Rejected. We avoid repetitions.
14147 | 18 | 40 | 18 | 40 | What about implications of dietary change? [Extra Policinga, Germany] | Accepted. Included with review of more literature in table and relevant sections
7969 | 18 | 41 | 18 | 42 | This is an important statement. I even suggest adding that this will help prevent redoucement effects. [Jasen Kemper, United Kingdom [of Great Britain and Northern Ireland]] | Taken into account. More of the recent literature has been consulted and the references included.
18741 | 18 | 41 | 18 | 45 | Are these statements from Plessers and Dunsor, 2017? If not, please cite additional references where this information has come from. If so, please cite reference again to make this clear. [William Moufouma Olaka, France] | Taken note of. Added additional references.
1672 | 18 | 41 | 18 | 50 | Behaviour changes towards food waste reduction will also contribute to climate change mitigation. About a third of overall global greenhouse-gas emissions from agriculture could be traced back to food waste by 2050. Please see Hu et al. 2016. ESAF [Pradhan Priyad, Germany] | Accepted, reference added.
7374 | 18 | 53 | 18 | 58 | Content provides life improvement on long standing debates. Association with SDGs obstacles more than it aids to the argument. [Bruce Corme, Canada] | Accepted. Included
1137 | 18 | 54 | 19 | 25 | Are these statements from Plessers and Dunsor, 2017? If not, please cite additional references where this information has come from. If so, please cite reference again to make this clear. [William Moufouma Olaka, France] | Taken note of. Added additional references.
18742 | 18 | 56 | 18 | 56 | Reference: 1. Ploggbe 2013 please fit to show correct information [William Moufouma Olaka, France] | Done
7375 | 19 | 1 | 19 | 25 | Make reference to energy access and issues related to tackling energy poverty. [Eleni Kaditi, Austria] | Accepted. Included with review of more literature in table and relevant sections
4223 | 19 | 2 | 19 | 6 | There is a numberous from agriculture that underline the statement and points cited. [Paul Creutzig, Germany] | Added to the text.
15421 | 19 | 6 | 19 | 6 | At the end of the sentence...and lower risks for ecosystems in a new sentence can be added: "Particularly relevant is off-grid food refrigeration in crises using naturally cold air . an connection or head pumps locally powered by renewable energy sources, or using waste heat because of its impact in food security. [Francisco Javier Hurtado Albiir, Germany] | Rejected. No reference to literature.
Comment No | From Page | From Line | To Page | To Line | Comment | Response
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17394 | 19 | 14 | 19 | 14 | Bio-diesel — derived from what? Natural gas is a subject to a serious upturn concerns will matter, clump throughout it’s entire well or well to well (shipping). Are there inherent risks in storage and accidental release and the carbon intensity of the full footprint of LNG has been shown to be higher than is the potential benefits (at least in shipping) in research from Chalmers University. Cost-effective choices of marine fuels under stringent carbon dioxide targets, 2013. Marie Gehrm, Marie TBergejd, Selina Bengtsson, Karin Anderson, & Hanne Johansson. http://publications.lib.chalmers.ac/se/reports/193049/local/193049.pdf (Owen Allenby, United Kingdom (of Great Britain and Northern Ireland)) | This section deals with SIS/SDG implications of various mitigation options/pathways. What options work for what kind of constraints is covered in Chapter 2.
17395 | 19 | 14 | 19 | 14 | Can you clarify how electric vehicles provide the largest number of SDG benefits? Also the environmental impacts of the supply chain and lifecycle of electric vehicles as well as the infrastructure investments required should also be taken into consideration. (Michelle Leske, Canada) | Noted. Text revised.
17744 | 19 | 18 | 19 | 18 | Explain what CCS is (not all will get it as a carbon capture system) (Artash Paul Antony, United States of America) | Done.
18744 | 21 | 25 | 21 | 25 | This paragraph seems to put coal reduction, natural gas use and nuclear + 'renewables' on even footing. They aren't. The GHG emissions from natural gas achieve this without innovation to remove the carbon footprint? (Michelle Leske, Canada) | Noted. Changed text includes more recent literature.
14298 | 19 | 22 | 19 | 22 | A reference is needed for this paragraph (Wilfried Moufouma Okia, France) | Accepted. Table 5.1 has all the references. Nine included in the text as well.
14299 | 19 | 25 | 19 | 25 | This paragraph seems to put coal reduction, natural gas use and nuclear + 'renewables' on even footing. They aren't. The GHG emissions from natural gas achieve this without innovation to remove the carbon footprint? (Michelle Leske, Canada) | Taken into account. Text revised.
6622 | 19 | 22 | 20 | 3 | The cross sector policy measures mentioned here do not consider institutional reforms (for example the creation of a climate mitigation and energy policy that explicitly target large power relations (such as the food footprints) as possible points of systemic and cross-sector intervention. This is also a more general comment on the entire Chapter, and one which decreases towards the final sections. The structural re- organisation suggested above would facilitate the report addressing current blind spots in climate mitigation literature, which is largely in domains of the social sciences and humanities, such as understanding values, beliefs, norms, identity, change, politics, political economy and power. Ref Leyshon, C. (2014). Critical issues in social science climate change research. Contemporary Social Science, 9(4), 359–373. | Noted. However, it is not the scope of this report to update the analysis of nuclear power per se. The refer to the IPCC AR5 WG1 Chapter 7 for a detailed assessment. In this section we have comprehensively assessed the synergies and trade-offs across all SDGs and mitigation options.
6118 | 20 | 35 | 20 | 35 | It’s not quite clear which ‘Studies show’ — maybe include this a bit more clearly on this line, where the numbers are being drawn from. (Petre Jeniat, United Kingdom (of Great Britain and Northern Ireland)) | Noted. Text revised. | Table 5.1 included now. | Declined.
18745 | 19 | 35 | 19 | 35 | This section of text states this information is based on case studies however only one reference, which also case study, is cited. Please provide further references to support the statement. (Wilfried Moufouma Okia, France) | Noted. Text revised.
17745 | 19 | 38 | 19 | 38 | Please consider to replace to "non-renewable inputs could be saved by almost 100%, imported resource inputs by 26% and associated services by almost 10%", for avoiding the use of too many decimal behind the comma. (Divina Christopher, Norway) | Accepted. Text revised.
17393 | 19 | 25 | 19 | 25 | Nuclear power impacts on SDGs are highly suggested — there are large embedded energy costs, serious concerns about the availability and secure access to fuel stocks. The impact of nuclear accident clean up and multi generation liabilities etc are categorically all of the principle of sustainability. The price tag of the clean up for Fukushima has already mean to $250,000m, which has diverted from other low carbon energy options, such as geo-thermal. When decommissioning, long term storage and security/insurance issues are added to the costs, then this cannot be seen as a credible ‘sustainable’ option. A clear indication of this has been the recent UK offshore wind energy price dropping well below nuclear. Official data published on Monday reveals that offshore wind projects due to generate power in 2021-22 were awarded contracts at £74.5 per megawatt hour, while those set to generate in 2022-23 were awarded contracts for a subsidy of just £37.90. That’s significantly lower than the £90-550 contracts awarded to France’s EDF in 2012 to build Hinkley Point C, which will be Britain’s first new nuclear plant in over two decades. | Taken into account. Text revised.
7131 | 19 | 48 | 19 | 48 | Subsidizing private wind or solar production (either directly via feed-in tariffs) favors people who are able to invest compared to those who are not. It is a mechanism by which poor-off producers are subsidized by lower revenue electricity consumers. It is, basically, an unequitable process. (Herve Leyshon, C. (2014). Critical issues in social science climate change research. Contemporary Social Science, 9(4), 359–373. | Noted. We are discussing synergies and trade-offs of mitigation options and are shown in Table 5.1 and figure 4.1. Synergies is a policy instrument for coordinating synergies. Corrective measures are mentioned in various parts of the chapter 5.4.1, 5.4.3, 5.5.6
18746 | 19 | 53 | 19 | 53 | Please use spaces in between s and numbers when listing the SDGs (Wilfried Moufouma Okia, France) | Noted.
6119 | 20 | 2 | 20 | 2 | A study is mentioned here, but not cited. (Petre Jeniat, United Kingdom (of Great Britain and Northern Ireland)) | Noted. Text revised.
### IPCC WGI SR15 First Order Draft Review Comments And Responses - Chapter 5

<table>
<thead>
<tr>
<th>Comment No</th>
<th>From Page</th>
<th>From Line</th>
<th>To Page</th>
<th>To Line</th>
<th>Comment</th>
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<tr>
<td>4233</td>
<td>20 3</td>
<td></td>
<td></td>
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<td>Which study? Cite. (Pete Cressly, Germany)</td>
<td>Accepted. Test reviewed.</td>
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<td>7742</td>
<td>20 3</td>
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<td>20 3</td>
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<td>Example: UTM? (Liam Pavasari, United States of America)</td>
<td>To Reconsider.</td>
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<td>2638</td>
<td>20 5</td>
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<td>20 25</td>
<td></td>
<td>Indecision in relation to SDGs around food security and equitable distribution of food? (Zohra Shawoon, United Kingdom of Great Britain and Northern Ireland)</td>
<td>Taken into account. More of the recent literature has been consulted and the references included. The section has been revised and the statements have been nuanced according to the literature.</td>
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<tr>
<td>19064</td>
<td>20 5</td>
<td></td>
<td>20 25</td>
<td></td>
<td>5.4.1 Synergies between Mitigation Options and Sustainable Development, 5.4.1.3 Land-based agriculture and forestry sector mitigation options. I recommend addition of the following sentence. “between today (2017) and Agricultural intensification” “Countries with peel soils can reduce emissions and potentially access REDD+ funding by conserving or restoring the hydroporphy of these carbon dense soils” (Suzanne Grover, Australia)</td>
<td>Noted. But would need a peer reviewed reference.</td>
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<td>7546</td>
<td>20 5</td>
<td></td>
<td>20 25</td>
<td></td>
<td>Consider including conservation or avoided degradation of wetlands/peatlands in this section. (Sylvia Christophersen, Norway)</td>
<td>Noted. This is very relevant for the analysis of the role of forests as a mitigation option, which is part of Chapter 4 of this report. However, the comment is placed within the section 5.4, which analyses synergies and trade-offs between mitigation response options and sustainable development. The section has been revised and the statements have been nuanced according to the literature.</td>
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<td>1673</td>
<td>20 5</td>
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<td>20 25</td>
<td></td>
<td>Food waste reduction can contribute to reduce one tenth of agricultural greenhouse gas emissions. (Please see HLC et al. 2010 ESAT. [Hannah Pegal, Germany])</td>
<td>Taken into account. More of the recent literature has been consulted and the references included. The section has been revised and the statements have been nuanced according to the literature.</td>
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<tr>
<td>6377</td>
<td>20 5</td>
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<td>20 25</td>
<td></td>
<td>Ex: Stumled by the lack of substance and detail in the section. Food security and agriculture mitigation offers enormous and diverse co-benefits, starting from efforts to increase productivity and resilience which increase food supply but also lower emissions intensity of food production, to demand-side measures that increase resilience and protect against price spikes, to the role of international markets. There are virtually no citations in this section (one to AR5, one to a new study - a single one), and the interaction of increasing efficiency and productivity with mitigation and sustainable development (meatless eating, etc) seems to be almost entirely missing. Also a lot of quantification would be possible to lead substance to this discussion, which has not even been attempted. Please get some contributing authors to fill this gap. Food security is the one SDG dimension that is explicitly called out in article 2 of the Paris Agreement - this deserves and indeed requires a much more thorough treatment than the authors have given the subject in this draft to do justice to the agreed outline of the chapter. (Andy Reisinger, New Zealand)</td>
<td>Taken into account. More of the recent literature has been consulted and the references included. The section has been revised and the statements have been nuanced according to the literature.</td>
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<td>17250</td>
<td>20 5</td>
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<td>20 5</td>
<td></td>
<td>Section 5.4.1.3. The section can be strongly linked to opportunities this provides for poverty alleviation and how can this also generate sustainable livelihoods for forest communities and farmers. (More review on this could be added. [Himanshu Gupta, India])</td>
<td>Taken into account. More of the recent literature has been consulted and the references included. The section has been revised and the statements have been nuanced according to the literature.</td>
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<tr>
<td>6388</td>
<td>20 6</td>
<td></td>
<td>20 25</td>
<td></td>
<td>Beyond forestry, agroforestry and agroecology are key for mitigation, especially for smallholders. (Joao Arthur Pompeu Pavanelli, Brazil)</td>
<td>Noted. The comment is very relevant for the analysis of the role of forests as a mitigation option, which is part of Chapter 4 of this report. However, the comment is placed within the section 5.4, which analyses synergies and trade-offs between mitigation response options and sustainable development.</td>
</tr>
<tr>
<td>5079</td>
<td>20 6</td>
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<td>20 25</td>
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<td>There is mention of the importance of guaranteeing access to land and territory by indigenous populations and rural poor. This is a structural problem in the countries of Asia, Africa and Latin America. (CRISTIANO DESCONIS, Brazil)</td>
<td>Noted. This chapter deals with corrective measures for strengthening synergies with various SDGs and mitigation/adaptation response options. We assessed available literature. No reference to appropriate literature is mentioned in here.</td>
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<tr>
<td>9627</td>
<td>20 6</td>
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<td>20 7</td>
<td></td>
<td>We need to cite references that analyze the land use components of land use, and its impact on GHG emissions. (as Greens, G et al. [2017]) The key role of forests in managing climate targets requires scientific credibility. Nature Clim. Change 7, 220-226; Forcell, N. et al. (2016) Assessing the REDD+ land use, land use change, and forest emission projections. Carbon Balance and Management 11, 26. (Michel den Elzen, Netherlands)</td>
<td>Noted. The comment is very relevant for the analysis of the role of forests as a mitigation option, which is part of Chapter 4 of this report. However, the comment is placed within the section 5.4, which analyses synergies and trade-offs between mitigation response options and sustainable development.</td>
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<td>6507</td>
<td>20 10</td>
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<td>20 10</td>
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<td>The description of “One of the key UNFCCC and bilateral mechanisms promoting…” is not correct. Not only UNFCCC, but also other multilateral institutions involved in the implementation of REDD. Further, not only multilateral and bilateral agencies also private sectors and NGOs are important in implementing the REDD. One way to describe is “one of the key mitigation measures in the forest sector that has been introduced under the UNFCCC agenda to REDD.” (Marta Kaneko, Japan)</td>
<td>Noted. Test reviewed.</td>
</tr>
<tr>
<td>6508</td>
<td>20 11</td>
<td></td>
<td>20 12</td>
<td></td>
<td>The explanation of REDD+ &quot;REDD+ (Reducing Emissions from Deforestation and Forest Degradation) which supports sustainable management, enhancement and conservation of forests and carbon stocks” is wrong, because sustainable management etc are included in the title “(7)” part. Also it is necessary to add the word “in developing countries” REDD+ is “Reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries” which contribute to emissions reduction and also to produce multiple benefits like biodiversity conservation. (Marta Kaneko, Japan)</td>
<td>Noted. Test reviewed.</td>
</tr>
<tr>
<td>6509</td>
<td>20 11</td>
<td></td>
<td>20 12</td>
<td></td>
<td>REDD+ not only contributes to emissions reductions, but also contributes to biodiversity conservation and climate change adaptation. See Monta, Kaneko and Karthik Malamuna (2017) REDD+ Financing to Enhance Climate Change Mitigation and Adaptation and Biodiversity Co-benefits. Lessons from the Global Environment Facility. AGRIT AX, Journal of Agricultural Science. Forthcoming Abstract: This study explores ways to effectively and efficiently Finance Reducing Emissions from Deforestation and Forest Degradation (REDD+) to enhance climate change adaptation and biodiversity conservation by drawing on lessons from the Global Environment Facility (GEF). The study analyzes trends in the focal areas of GEF forest-related projects, the implementing and executing agencies involved in GEF forest-related multi-focal area projects, and the co-funders of GEF forest-related projects. The study analyzed trends in the focal areas of GEF forest-related projects, the implementing and executing agencies involved in GEF forest-related multi-focal area projects, the key agencies that support REDD+ activities and enhance these co-benefits are the United Nations Development Program (UNDP), the World Bank, the Food and Agriculture Organization (FAO), the United Nations Environment Program (UNEP), and the national governments of developing countries. GEF and the co-funders—multilateral aid agencies, such as UNEP, FAO, the World Bank, the Asian Development Bank, and UNEP, bilateral aid agencies, such as Germany, the European Union, and the United States, non-governmental organizations, and the private sector—all work to enhance REDD+ co-benefits. Because private contributions to the GEF are limited, it is important to design a scheme to mobilize more private financing for REDD. (Marta Kaneko, Japan)</td>
<td>Noted. Test reviewed.</td>
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<tr>
<td>14148</td>
<td>20 12</td>
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<td>20 12</td>
<td></td>
<td>Export role of CSA and associated concepts (see also the Report of the FAO-IPCC Expert Meeting on Climate Change, Land Use and Food Security, <a href="https://ipcc.ch/supporting-material/EM_FAO">https://ipcc.ch/supporting-material/EM_FAO</a> IPCC report.pdf) (Elvira Poloczanska, Germany)</td>
<td>Taken into account. The statements have been nuanced according to the peer reviewed literature.</td>
</tr>
</tbody>
</table>
This is an unattributed statement. In fact, the literature is often quite critical of “climate-smart agriculture.” See, for example Neufeldt et al. (2013) Beyond climate-smart agriculture: borders and localities for global food systems. Agriculture & Food Security 2:1. A quote from the abstract "we argue that the concept needs to be evaluated critically because the relationship between the three dimensions is poorly understood, such that practically any improved agricultural practice can be considered climate-smart. [Dorren Stabinsky, United States of America]"

Comment No 19635

Page: 20 From: 12 To: 13

This statement needs to be backed up with literature. There is a significant amount of research looking at this topic, but we cannot find a study that examines this relationship in more detail. Additionally, there is a need for more research on how climate-smart agriculture can help to mitigate the effects of climate change. [William Moufouma Okia, France]

Response

Text revised. Literature consulted and added.

Comment No 19637

Page: 20 From: 23 To: 25

Within the comfort and well-being parameters there could be some conflicts. For example, natural ventilation or higher rates of cooling may also have an adverse effect on people’s health. People may want more outdoor space near the building (Double and de Dear). Green occupants for green buildings (the meaning link). Build. Environ., 56 (2012): 21–27. There could be also conflicts between comfort and health, e.g. natural ventilation can also be harmful to those who are susceptible to airborne pollution. All the above examples suggest that the relationship between ventilation and health is complex and requires further research. [Hafizah Muhaimin, Malaysia]

Response

Taken into account. The section has been revised and the statements have been nuanced according to the literature. More of the recent literature has been consulted and the references included.

Comment No 19791

Page: 20 From: 28 To: 28

The section on trade-offs between mitigation action and SDI is missing reference. It is important to note that SDI and agenda 2030 are grounded in a human rights framework, trade-offs between human rights and mitigation must be managed carefully. For example, studies related to biodiversity, renewable energy, REDD, etc., are carried out by Action and Learning People at the Centre on Climate Change (Nov 2013). Online at http://www.redd.org/content/uploads/2013/11/RPP-Red-4.pdf. For Human Rights and Business Resource Centre: https://business-humanrights.org/en/case-studies-renewable-energy/ [Tara Leslie, Canada]

Response

Taken into account. The section has been reviewed and the statements have been nuanced according to the literature.

Comment No 17251

Page: 20 From: 30 To: 30

The title is too broad for the content of the paragraph. The text could mention about efficiency improvement policies on the supply side and how it can help to meet the emission reduction target. [William Moufouma Okia, France]

Response

Taken into account. The section has been revised and the statements have been nuanced according to the literature. More of the recent literature has been consulted and the references included.

Comment No 14149

Page: 20 From: 38 To: 38

What about the trade-offs regarding the production of raw materials for the production of energy technologies, e.g. solar panels? [Heiko Polzelsmeier, Germany]

Response

We have added a discussion on the trade-offs and references to Table 5.1 to more comprehensively assess the synergies and trade-offs regarding renewables. Literature consulted and added.

Comment No 10624

Page: 20 From: 38 To: 50

The section on the Future of the section check-out. However, the context of this section is not clear. This section could be improved by providing more specific examples of how efficiency improvement policies can be implemented. [Fabiolo Monforti Ferrario, Italy]

Response

Taken into account. The statements have been nuanced according to the literature. Literature consulted and added.

Comment No 17396

Page: 20 From: 38 To: 50

Agreed - Nuclear – see above comment. Biofuels are again focused on 1st generation fuels derived from primary agricultural products rather than using waste feedstock. This is in line with the Intergovernmental Panel on Climate Change (IPCC) report (2014). There is a need for more research on how biofuels can be produced in a sustainable manner. [Doreen Stabinsky, United States of America]

Response

Taken into account. The section has been revised and the statements have been nuanced according to the literature. More of the recent literature has been consulted and the references included.

Comment No 13515

Page: 20 From: 38 To: 21

Sustainable energy is a recognized tool for leapfrogging the energy poverty gap in developing countries. More details in Szabo et al. RSER 28, 2013. [Makoto Ehara, Japan]

Response

Text revised. More of the recent literature has been consulted and the references included.

Comment No 2814

Page: 20 From: 42 To: 42


Response

The statement has been revised and the sections have been nuanced according to the literature.

Comment No 4300

Page: 20 From: 44 To: 50

Please further elaborate how nuclear creates low-carbon energy. According to the IPCC, nuclear power produces less carbon per kilowatt hour, when the entire lifecycle is taken into account, than most other energy sources including wind and solar. In Canada, there is a plan in place for the recycling of used fuel. This project is currently with the NRMDO (Nuclear Waste Management Ontaro). Take a look at the CANDU AFCR reactor as one example where used fuel can be recycled into new CANDU reactors could be used as the fuel source in the AFCR. Additionally, in most jurisdictions, nuclear waste is monitored and tracked. As an example, in Canada all nuclear regulations fall under the Canadian Nuclear Safety Commission (CNSC) which both regulates and monitors the safety of nuclear reactors and is located in Ottawa. Additionally, in high-level radioactive waste is currently used in the production of medical isotopes. Additionally, in high-level radioactive waste is currently used in the production of medical isotopes. Additionally, in high-level radioactive waste is currently used in the production of medical isotopes. Additionally, in high-level radioactive waste is currently used in the production of medical isotopes. [Michelle Lesser, Canada]

Response

Taken into account. The statements have been nuanced according to the literature. More of the recent literature has been consulted and the references included.
Comment No   From Page   From Line   To Page   To Line   Comment   Response
4209   20   46   20   49   As stated in the comments for Chapter 2 and 4, there is some concern of bias evident in the report against nuclear energy, without fair consideration of the associated hazards and exposure. As a general principle, editors and reviewers should have a background in nuclear science and yet this technology is mentioned several times in the report, along with a substantial number of relevant references. The absence of a scientist in this field can therefore question the report’s authority and ability to present all energy technologies in a balanced manner.
   Noted. It is not the scope of this report to update the analysis of nuclear power per se. We refer to the IPCC AR5 WGI Chapter 7 for a detailed assessment. However, we have added many additional references and evidence to provide a more comprehensive assessment of synergies and trade-offs across all SDGs and mitigation options.

15009   20   50   20   50   Decay rate of CO2 from combustion processes is likely to be lower than for some nuclear reactors. The report misses opportunities to highlight the potential benefits of nuclear systems, including cost competitiveness and low-greenhouse gas emissions, which are critical for achieving the 2050 target. The report should have included a more comprehensive assessment of the potential contributions of nuclear energy to the 2050 target.
   Noted. We refer to the IPCC AR5 WGI Chapter 7 for a detailed assessment. However, we have added many additional references and evidence to provide a more comprehensive assessment of synergies and trade-offs across all SDGs and mitigation options.

6099   20   47   20   47   The LNT is used in the IPCC AR5 report in Chapter 7 Energy Systems and actually misrepresents the recommendations of UNSCEAR on page 550 “such estimates are neither endorsed nor disputed by UNSCEAR” (Balboni et al., 2011) when in fact UNSCEAR clearly states that making such estimates is inappropriate on low doses is inappropriate. We refer to the report’s Appendix B for further details. The statements in lines 47 and 48 could be questioned.
   Noted. We modified the text on CCS in Table 5.1 to: “CCUS requires access to water for cooling and processing which could contribute to freshwater stress. However, the CCS process can potentially be configured for increased water efficiency compared to a system without carbon capture via process integration.” The references provided with Table 5.1 include the most recent paper by Brandl et al. (2017) “Evaluation of cooling requirements for post-combustion CO2 capture applied to coal-fired power plants.” Chemical Engineering Research and Design 122 (2017) 1-10. This paper demonstrates opportunities to reduce water use at CCS facilities. We have also added additional references to show that the negative impacts from CO2 leakage may be less problematic (in terms of SDG) than previously considered, namely Jones, D. G. et al. (2015). "Developments since 2005 in understanding potential environmental impacts of CO2 leakage from geological storage.” International Journal of Greenhouse Gas Control 45(Supplement C): 350-377.

   Noted. It is not the scope of this report to update the analysis of nuclear power per se. We refer to the IPCC AR5 WGI Chapter 7 for a detailed assessment. However, we have added many additional references and evidence to provide a more comprehensive assessment of synergies and trade-offs across all SDGs and mitigation options.

1977   20   50   20   50   The LNT is used in the IPCC AR5 report in Chapter 7 Energy Systems and actually misrepresents the recommendations of UNSCEAR on page 550 “such estimates are neither endorsed nor disputed by UNSCEAR” (Balboni et al., 2011) when in fact UNSCEAR clearly states that making such estimates is inappropriate on low doses is inappropriate. We refer to the report’s Appendix B for further details. The statements in lines 47 and 48 could be questioned.
   Noted. It is not the scope of this report to update the analysis of nuclear power per se. We refer to the IPCC AR5 WGI Chapter 7 for a detailed assessment. However, we have added many additional references and evidence to provide a more comprehensive assessment of synergies and trade-offs across all SDGs and mitigation options.
The case study of the citation of Colenbrander et al. 2016 is Kolkata not Kigali [Moshe Kinn, United Kingdom (of Great Britain and Northern Ireland)] Accepted. Text revised

Good remark on the possible negative social outcome of renewable subsidizing [Herve Nifenecker, France] Thank you.

Section 5.4.2.3. Mention can be made of safety and quality codes and standards for different options (specially, but not limited to infrastructure), which if

17252 21 23 21 29 29
A mention of maladaptation could be made here. In fact, in many cases, especially forestry projects reduced livelihood opportunities for the already poor population. These can be enriched with suitable references so that it helps countries in deciding guidelines for the new mechanisms and focus on a multi-benefit approach rather than just carbon sequestration. [Himpempe Gupta, India] Noted. Text revised in this section we are considering mitigation options and SDG linkages. The latter include the impact of non-climate actions as well.

17250 21 23 21 29 29
The statements with regard to the CDM-credits, project type and regional distribution are entirely vague. There is simple literature to state that the CDM generated significant co-benefits, has massively mobilized renewable energy and recently - through its programmatic approach - generated a high share of activities in Africa. There is no academic literature on human rights issues with CDM projects to which energy source causes problem, with other SDG. On the nuclear side, it cannot simply be said over once in, strongly contradictive to, the notion that nuclear can cause significant adverse health implications. According to studies such as [1], it has lower cost of lives than all other considered and may be said to have positive implications on health. There are studies that there is a phenomenon of nuclear causes deaths due to a phasal effect. Hence nuclear power is perfectly equivalent with the usage of cooling water in any other kind of thermal power plant, this remark should thus also be made of biomass renewables, solar (thermal) plants and any other fossil fuel-based power with CCS. You may not have found criticism of the other thermal power sources in your literature studies for tables 5.1, but that doesn’t change the fact that the water use for these power sources fills the exactly same function and there is no excuse for pointing out nuclear selection as bad in this context. References: [1] https://doi.org/10.1016/S0140-6739(07)63253-7. [2] https://doi.org/10.1016/j.envpol.2015.04.023 [Peter Andersson, Sweden] Noted. It is not the scope of this report to update the analysis of nuclear power per se. We refer to the IPCC AR5 WGI Chapter 7 for a detailed account. We have split up the impacts of CCS between fossil vs. bio-energy. Regarding nuclear, we are basing our analysis on the IPCC AR5 WGI Chapter 7 for a detailed account.

10901 21 23 21 29 29
The statements with regard to the CDM-credits, project type and regional distribution are entirely vague. There is simple literature to state that the CDM generated significant co-benefits, has massively mobilized renewable energy and recently - through its programmatic approach - generated a high share of activities in Africa. There is no academic literature on human rights issues with CDM projects to which energy source causes problem, with other SDG. On the nuclear side, it cannot simply be said over once in, strongly contradictive to, the notion that nuclear can cause significant adverse health implications. According to studies such as [1], it has lower cost of lives than all other considered and may be said to have positive implications on health. There are studies that there is a phenomenon of nuclear causes deaths due to a phasal effect. Hence nuclear power is perfectly equivalent with the usage of cooling water in any other kind of thermal power plant, this remark should thus also be made of biomass renewables, solar (thermal) plants and any other fossil fuel-based power with CCS. You may not have found criticism of the other thermal power sources in your literature studies for tables 5.1, but that doesn’t change the fact that the water use for these power sources fills the exactly same function and there is no excuse for pointing out nuclear selection as bad in this context. References: [1] https://doi.org/10.1016/S0140-6739(07)63253-7. [2] https://doi.org/10.1016/j.envpol.2015.04.023 [Peter Andersson, Sweden] Noted. It is not the scope of this report to update the analysis of nuclear power per se. We refer to the IPCC AR5 WGI Chapter 7 for a detailed account. We have split up the impacts of CCS between fossil vs. bio-energy. Regarding nuclear, we are basing our analysis on the IPCC AR5 WGI Chapter 7 for a detailed account.

14259 20 47 20 50 20
Achieving deep cut in emissions through CDM and nuclear options can also have significant adverse implications for health and water security (SDG 3: "Ensure healthy lives and promote well-being for all at all ages"") and, increase the associated costs and risks associated with the handling of waste and abandoned reactors (see Section 5.4.2.3). CCS and nuclear aren’t the same thing. They shouldn’t be treated in the same sentence like this. Nuclear could potentially provide more freshwater by acting as a heat source for desalination. The statement about lack of high carbon development does not make sense in either case. The societal costs and risks associated with handling waste and abandoned reactors should be treated separately for CCS and nuclear as the waste handling is quite different between the two of them. The causal implication that nuclear waste is difficult to handle (compared to CCS) is erroneous, and should at least be cited rather than falsely stated. The mistaken belief that radioactive waste is so hard or hard to deal with than CCS may be the single biggest mental block preventing society from finding adequate climate change solutions. All 31 countries that have nuclear waste have worked out sufficient technical details about the safe handling of the waste that no one has ever been hurt by nuclear waste in the entire history of industry. People have been killed by CO2, but never due to carbon sequestration, but we aren’t doing CCS much yet. There’s a false equivalence being presented here. [Jason Donev, Canada] Noted. We have added many references in Table 5.1 and rewritten the section to provide a more comprehensive assessment of synergies and trade-offs across all SDGs and mitigation options.

7376 20 48 20 48 48
Delete the text "create locks in to high carbon development trajectories (SDG 13)" [Elen Kadi, Austria] Noted. Text revised in this section we are considering mitigation options and SDG linkages. The latter include the impact of non-climate actions as well.

13487 20 52 20 53 53

1067 20 58 21 21 22
Do Not Quote, Cite, or Distribute Page 30 of 54

Elvira Poloczanska, Germany

1224 20 46 20 50 50
Finally, the statement should be split up to clarify which SDGs are affected by nuclear and which by CCS. Grouping them together creates confusion as to which energy source causes problem with which SDG. On the nuclear side, it cannot simply be said over once in, strongly contradictive to, the notion that nuclear can cause significant adverse health implications. According to studies such as [1], it has lower cost of lives than all other considered and may be said to have positive implications on health. There are studies that there is a phenomenon of nuclear causes deaths due to a phasal effect. Hence nuclear power is perfectly equivalent with the usage of cooling water in any other kind of thermal power plant, this remark should thus also be made of biomass renewables, solar (thermal) plants and any other fossil fuel-based power with CCS. You may not have found criticism of the other thermal power sources in your literature studies for tables 5.1, but that doesn’t change the fact that the water use for these power sources fills the exactly same function and there is no excuse for pointing out nuclear selection as bad in this context. References: [1] https://doi.org/10.1016/S0140-6739(07)63253-7. [2] https://doi.org/10.1016/j.envpol.2015.04.023 [Peter Andersson, Sweden] Noted. It is not the scope of this report to update the analysis of nuclear power per se. We refer to the IPCC AR5 WGI Chapter 7 for a detailed account. We have split up the impacts of CCS between fossil vs. bio-energy. Regarding nuclear, we are basing our analysis on the IPCC AR5 WGI Chapter 7 for a detailed account.
IPCC WGI SR15 First Order Draft Review Comments And Responses - Chapter 5

Comment No | From Page | From Line | To Page | To Line | Comment | Response
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1883 | 21 | 24 | 21 | 25 | The Clean Development Mechanism (CDM) revealed - Croise (2012): Similar problems exist for the voluntary market, although - the Clean Development Mechanism (CDM) revealed - Croise (2012): Similar problems exist for the voluntary market, although - [Tibor Farago, Hungary] | Noted. Text substantially revised with focus on mitigation options and SDG implications across various sectors. CDM is an instrument. Role of carbon price market and other policy instruments are included in the section 5.4
18748 | 21 | 24 | 21 | 29 | 

| 21 | 27 | 21 | 27 | Again, studies are referred to without it being clear which studies. [Heid Jerzid, United Kingdom (of Great Britain and Northern Ireland)] | Noted. Text substantially revised with focus on mitigation options and SDG implications across various sectors. CDM is an instrument. Role of carbon price market and other policy instruments are included in the section 5.4
6120 | 21 | 27 | 21 | 27 | | Noted. Section substantially revised and included.
12108 | 21 | 27 | 21 | 29 | | Noted. Text substantially revised with focus on mitigation options and SDG implications across various sectors. CDM is an instrument. Role of carbon price market and other policy instruments are included in the section 5.4
7743 | 21 | 28 | 21 | 29 | Adding a reference to justify the statement mentioned would be good [Areesh Paul Antony, United States of America] | Noted. Text substantially revised with focus on mitigation options and SDG implications across various sectors. CDM is an instrument. Role of carbon price market and other policy instruments are included in the section 5.4
9629 | 21 | 31 | 21 | 32 | Add the content [Jianwei Wu, China] | Noted. Text revised.
15010 | 21 | 33 | 21 | 33 | Add pro poor mitigation policies - reads like an advocacy statement [Farhan Akhtar, United States of America] | Noted. Text revised
2312 | 21 | 35 | 21 | 35 | Rephrasing to avoid the similarity in the literature. [Ahmed Zobaa, United Kingdom (of Great Britain and Northern Ireland)] | Noted. Text revised
12109 | 21 | 39 | 21 | 42 | Comparison of "mitigation cost" is always arguments of all policy debate because its definition varies model by model. If the chapter touches on the argument, the fact that there are many different approaches, definition, models, and results, should be introduced and stressed. Marginal abatement cost and some other cost are discussed at 2.2.5 but at this section it is just "mitigation cost". What is the difference should be mentioned if mitigation cost is introduced here. [Takashi Hongo, Japan] | Noted. Text revised
9123 | 21 | 42 | 21 | 42 | Fujimori et al. (2018) also shows that NDC cost differs across countries. At the same time, the emissions trading system can reduce the mitigation cost largely by 80% [Himangana Gupta, India] | Noted. Text revised.
17353 | 21 | 45 | 21 | 45 | Section 5.4.2.2: Can this be linked to section 5.4.1.5 or the heading be changed to thresholds in the agriculture and forestry sector mitigation options? [Marianna Gupta, India] | Noted. Section restructured and text revised.
4362 | 21 | 45 | 21 | 45 | Please improve the section "5.4.2.4 Land-based agriculture and forestry sector mitigation options", being more specific in what types of mitigation could be implemented in the different regions of the globe. [Gabriel de Oliveira, Brazil] | More of the recent literature has been consulted and the references included. The section has been revised and the statements have been nuanced according to the literature.
14150 | 21 | 45 | 21 | 45 | Include climate-smart agriculture and associated concerns (e.g., Neufeldt et al. 2013, https://doi.org/10.1186/2046-9121-12-2) [Elifra Polonskaia, Germany] | Agreement. Reference included
10625 | 21 | 45 | 21 | 53 | The mention of this trade off is of great importance to the success of REDD in situations where enroachment on REDD projects are too casually managed. [Elmer Brianta-Eslando, Costa Rica] | Noted. Text revised
18749 | 21 | 45 | 21 | 55 | Introducing gender here seems a bit tangented, as there is no mention in the equivalent section in 5.4.1.3. Additionally, this only focuses on REDD. Are there studies that look at this in the context of BECCs, for example? Perhaps impacts on gender could be assessed in a specific section focusing on that? It’s the CDM is an instrument. Role of carbon price market and other policy instruments are included in the section 5.4 | Noted. Text revised
5136 | 21 | 45 | 22 | 22 | It’s surprising that there is no discussion here of BECCS and concerns that have been raised regarding potential pressure on arable land, under BECCS at the scale that may be required, and resulting negative impacts on land rights, livelihoods, food security, water, and biodiversity. While implications of mitigation on food security, specifically, are discussed in Section 5.4.3.2, the issue of BECCS warrants discussion in the trade-offs section, as this would enable other discussion of the dynamics at play, from governance of land tenure to availability of land to biodiversity and food security (each being part of different SDGs). [Tanya Rawes, United States of America] | Noted. Text section revised and included in Table 5.1 and Figure 5.4
5138 | 21 | 45 | 22 | 25 | The discussion of trade-offs should consider both the number of people who would be at risk of hunger because of mitigation policies and the number of people who would NO LONGER be at risk of hunger because of mitigation policies that enable achieving the 1.5°C target. If a net figure can be derived, that is helpful in articulating the trade-off - albeit likely with regional differences. [Tanya Rawes, United States of America] | Noted. No references suggested.
19065 | 21 | 45 | 22 | 25 | More of the recent literature has been consulted and the references included. The section has been revised and the statements have been nuanced according to the literature. | More of the recent literature has been consulted and the references included. The section has been revised and the statements have been nuanced according to the literature.
6378 | 21 | 45 | 22 | 5 | Similar to comments on page 30, lines 5-23, I find this section extremely weak and thin. There is a lot of work on potential impacts of mitigation measures in the land sectors, e.g., Henderson et al. at 2017, power and pan of market based policies, and a lot of work on sustainable consumption options that are much more nuanced than the blanket current statement that cutting livestock consumption can undermine livelihoods. This section has not even begun to scratch the surface of the literature I believe. Please see some contributing authors that can fill this gap, as it stands, this section does not meet the requirement of the IPCC to provide a comprehensive and unbiased assessment of the relevant literature. [Andy Hauenger, New Zealand] | More of the recent literature has been consulted and the references included. The section has been revised and the statements have been nuanced according to the literature.
10260 | 21 | 46 | 21 | 49 | She also needs to mention here a country political appetite that drives economics of supply and demand for timber, e.g. a case of deforestation of Bialowieza forest in Poland and in Finland. These are well known cases. [Himangana Gupta, United Kingdom (of Great Britain and Northern Ireland)] | Noted. Text substantially revised with focus on mitigation options and SDG implications across various sectors. CDM is an instrument. Role of carbon price market and other policy instruments are included in the section 5.4
2313 | 21 | 51 | 21 | 51 | Rephrasing to avoid the similarity in the literature. [Ahmed Zobaa, United Kingdom (of Great Britain and Northern Ireland)] | Noted. Text substantially revised with focus on mitigation options and SDG implications across various sectors. CDM is an instrument. Role of carbon price market and other policy instruments are included in the section 5.4
10626 | 21 | 54 | 21 | 54 | This comment attempts the importance of local biophysical dynamics, which is essentially a success approach to REDD+ implementation. [Elmer Brianta-Eslando, Costa Rica] | Noted. Repeated. Outdate the scope of the chapter to assess NDC implications of individual countries. We focus rather on generic findings common to the application of different mitigation options
7734 | 22 | 22 | 22 | 22 | Comments within the section, the impacts of population and population growth rate should be discussed. Population level and distribution pattern influence the current and prospective impacts of global climate change on social and sustainable development indices. [Hanil Iryong, Korea] | Noted. Text substantially revised with focus on mitigation options and SDG implications across various sectors. CDM is an instrument. Role of carbon price market and other policy instruments are included in the section 5.4

Page 31 of 54
The consequence of deployment of CCS in the power sector is included in the table. But CCS deployment for energy intensive industries is not included.

argue that human and physical capital invested in CCS is an investment in a low-Carbon technology and not in the fossil-resources industry. [Aage and BECCS is related to bioenergy, not fossil fuels. As such BECCS can not lead to lock-in of capital in fossil-resources industry! Furthermore, I would because of lock-in of human and physical capital in the fossil-resources industry. This is far too harsh! Please remember that BECCS is included here.

It says in the table that deployment of CCS in the power sector (either with fossil fuels or BECCS) will have a negative effect on innovation and growth.

Universal Jasmine, Austria] uncertain, with some studies showing possible benefits for export revenues in the medium term until about 2050 (medium confidence). The availability of revenues for fossil fuel exporters, but differences between regions and fuels exist (high confidence). Most mitigation scenarios are associated with quantified (high confidence). Whether or not side-effects materialize, and to what extent side-effects materialize, will be case- and site-specific, as they.

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<tr>
<td>5918</td>
<td>22</td>
<td>36</td>
<td>22</td>
<td>41</td>
<td>It says in the table that deployment of CCS in the power sector will have a negative effect on disease and mortality because of risk of leakage. This is far too broad! Lack of details can lead to wrong inferences. If there should be a leak from a CO2 storage site it will be in the form of small bubbles, not a big burst of a large CO2 plume replacing an air. A CO2 leak can have local effects on marine or land environment, but it will not have a severe effect on diseases and mortality in humans. A CO2 leak can contribute to ocean acidification, which is a big concern. However, without more details some readers can draw the wrong conclusion that CCS will have a strong negative effect on human diseases and mortality. [Jørgen Stangeland, Norway]</td>
</tr>
<tr>
<td>1884</td>
<td>22</td>
<td>50</td>
<td>22</td>
<td>53</td>
<td>Achieving 1.5°C or 2°C requires a achieving 1.5°C or 2°C targets requires (or) not exceeding 1.5°C or 2°C global warming requires [Ie Roh, Farago, Hungary]</td>
</tr>
<tr>
<td>1885</td>
<td>22</td>
<td>50</td>
<td>22</td>
<td>54</td>
<td>Deep cuts in GHG emissions large scale - a deep cut in GHG emissions by means of large scale [Ie Roh, Farago, Hungary]</td>
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<tr>
<td>19720</td>
<td>22</td>
<td>50</td>
<td>22</td>
<td>54</td>
<td>No reference to human rights [Tara Shire, Ireland]</td>
</tr>
<tr>
<td>2815</td>
<td>22</td>
<td>53</td>
<td>22</td>
<td>54</td>
<td>Please change &amp; to and [Tibor Zselényi, Poland]</td>
</tr>
<tr>
<td>17874</td>
<td>23</td>
<td>1</td>
<td>23</td>
<td>2</td>
<td>It has been noted that NDC will be evaluated. In addition to NDC submission, how the NDC translates into actions within country as an example should be added. For example: the use of planting calendar to help farmers, the implementation of crop insurance and etc. Country report on climate change of each country may help on this evaluation. [Pedram Pardip, Indonesia]</td>
</tr>
<tr>
<td>6122</td>
<td>23</td>
<td>1</td>
<td>23</td>
<td>24</td>
<td>This section is clear and purposeful, with a sense of direction and not too many general terms, and also good use of referencing. The boxes are helpful, with detail provided which is helpful as parts of the earlier report are rather general. [Heidi Jerstad, United Kingdom (of Great Britain and Northern Ireland)]</td>
</tr>
<tr>
<td>19795</td>
<td>23</td>
<td>1</td>
<td>23</td>
<td>21</td>
<td>Add reference to recent work of CNCHRI and WHO on climate change and the right to health. Use a right to health framing here. [Tara Shire, Ireland]</td>
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<td>5238</td>
<td>23</td>
<td>7</td>
<td>23</td>
<td>21</td>
<td>There is no mention of the major trade-off represented by biomass. Biomass is a clean fuel regarding GHG emissions, and thus has an important role to play in climate change mitigation. However, biomass is a major emitter of PM2.5 (especially modern biomass, but also traditional biomass for power generation). It feels like it should be mentioned in 5.4.2 &quot;Trade-off between mitigation options and sustainable development&quot; as well. [See RITE studies (I. San, A. Akhtar, K. G. O. An analysis on correlation between climate change mitigation and air pollution control by using a global energy system model, 11th SDEWES Conference, Sep. 2016, Lisbon, Portugal.), World Energy Outlook Special Report 2016: Energy and Air Pollution, and upcoming WEO2017 (Barthol Shah and Tehran, Japan)]</td>
</tr>
<tr>
<td>19066</td>
<td>23</td>
<td>7</td>
<td>23</td>
<td>21</td>
<td>S.5.5 Sustainable Development Implications of 1.5°C and 2°C Mitigation Pathways 5.4.3.1 Air pollution and health. I recommend adding of the following sentence at line 31 (a new last sentence for paragraph 1 of this section) &quot;Biofuel plants are also a major source of both greenhouse gases and particulate and gases material damaging to human health; the South East Asian stock (Hogg et al. 2016) Field measurements of trace gases and aerosols emitted by palm fires in Central Kalimantan, Indonesia during the 2015 El Niño, Atmospheric Chemistry and Physics Discussion, doi:10.5194/acp-2015-411, Xie et al. (2015) Impact of the June 2013 Riau Province Sumatra Smoke event on regional air pollution, Environmental Research Letters, doi:10.1088/1748-9326/11/7/070037, Consequently, peatland restoration measures aiming to end peatland fires can have co-benefits for global climate change and air pollution and human health in the Southeast Asian region.&quot; [Samer De'Gennaro, Australia]</td>
</tr>
<tr>
<td>6223</td>
<td>23</td>
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<td>21</td>
<td>The systemic implications of joint mitigation and wellbeing strategies on health go far beyond air pollution, with potentials to address both chronic lifestyle conditions and mental health issues through a re-orientation of values, beliefs and norms across societies. Rie Bhaskar, R. et al (2013) Interdisciplinary and Climate Change Transitions. Developing strategies and practices toward a sustainable future for our global climate. [Emily Tyler, South Africa]</td>
</tr>
<tr>
<td>2816</td>
<td>23</td>
<td>7</td>
<td>23</td>
<td>21</td>
<td>We focus rather on generic findings common to the application of different mitigation options. [Ahmed Zobaa, United Kingdom (of Great Britain and Northern Ireland)]</td>
</tr>
<tr>
<td>4201</td>
<td>23</td>
<td>8</td>
<td>23</td>
<td>21</td>
<td>Information further backed by the Asthma Society of Canada which found that shutting down the coal plants (Ontario resulted in direct improvements to air quality in the province. [<a href="http://www.newspaper.ca/news-relasee-air-is-cleaner-ontarians-health-air-ontario-shut-down-coal-611245495.html">http://www.newspaper.ca/news-relasee-air-is-cleaner-ontarians-health-air-ontario-shut-down-coal-611245495.html</a>] Michele Leclerc, Canada]</td>
</tr>
<tr>
<td>2315</td>
<td>23</td>
<td>8</td>
<td>23</td>
<td>21</td>
<td>Refocusing to avoid the similarity in the literature [Ahmed Zobaa, United Kingdom (of Great Britain and Northern Ireland)]</td>
</tr>
<tr>
<td>8570</td>
<td>23</td>
<td>8</td>
<td>23</td>
<td>21</td>
<td>Note: No text changes were added since the point is already made and there are space limitations. [Tibor Zselényi, Poland]</td>
</tr>
<tr>
<td>6324</td>
<td>23</td>
<td>8</td>
<td>23</td>
<td>9</td>
<td>This section is clear and purposeful, with a sense of direction and not too many general terms, and also good use of referencing. The boxes are helpful, with detail provided which is helpful as parts of the earlier report are rather general. [Heidi Jerstad, United Kingdom (of Great Britain and Northern Ireland)]</td>
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<tr>
<td>7815</td>
<td>23</td>
<td>9</td>
<td>23</td>
<td>10</td>
<td>This section needs a reference. [William McDougal Oka, France]</td>
</tr>
<tr>
<td>9695</td>
<td>23</td>
<td>9</td>
<td>23</td>
<td>10</td>
<td>CCS potentially as well, it does not solely apply to reduction of fossil fuels. [Jawern Kemper, United Kingdom (of Great Britain and Northern Ireland)]</td>
</tr>
<tr>
<td>13368</td>
<td>23</td>
<td>11</td>
<td>23</td>
<td>11</td>
<td>When referring to Figure 4-9 it used here, suggest indicating to the reader which part/panel of the figure this statement relates to. [Jordaan Nicol, United Kingdom (of Great Britain and Northern Ireland)]</td>
</tr>
<tr>
<td>569</td>
<td>23</td>
<td>15</td>
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<td>17</td>
<td>Recent multimodel comparisons indicate that mitigation pathways consistent with 1.5°C would result in considerably higher co-benefits for air pollution and health compared to pathways that stay below 2°C. The co-benefits of CCS with regard to health and environmental impacts are the most obvious of all mitigation paths. [Jørgen Stangeland, Norway]</td>
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<td>9629</td>
<td>23</td>
<td>21</td>
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<td>why the co-benefits for an emission is relatively small if compared to mitigation strategies consistent with 2°C and below? [Jiangguo Wu, China]</td>
</tr>
<tr>
<td>13488</td>
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<td>24</td>
<td></td>
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<td>The section 5.4.2 needs to make it more clear that these changes in food security associated with the 1.5 goal do not take into account adaptation. [Carl-Friedrich Schulzauer, Germany]</td>
</tr>
<tr>
<td>4363</td>
<td>23</td>
<td>24</td>
<td>23</td>
<td>24</td>
<td>[Mark it would be interesting here citing the importance of perennial crops (e.g. Oliver et al, 2010). Increased food and ecosystem security via perennial grains. Science, 328(5986), pp.1638-1639.] [Gabriel de Oliveira, Brazil]</td>
</tr>
<tr>
<td>1135</td>
<td>23</td>
<td>24</td>
<td>23</td>
<td>24</td>
<td>Expected to see discussion of the implications for food security given the impact of rising temperatures on crop productivity [see agmip.org] [Bruce Currie-Alder, Canada]</td>
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<tr>
<td>6570</td>
<td>23</td>
<td>24</td>
<td>23</td>
<td>41</td>
<td>Agreed similar to comments on page 20, lines 5-20, and page 21/22, this section is very thin. Key statements are based on 2 papers only, and those are model studies. There is an incredibly rich literature out there on the interplay between various mitigation pathways and SD objectives related to food security and hunger, and this section is simply not doing an adequate job in assessing this literature. [Andy Reasner, New Zealand]</td>
</tr>
<tr>
<td>1858</td>
<td>23</td>
<td>24</td>
<td>23</td>
<td>24</td>
<td>G4.6.2: The trade-offs, i.e. negative impacts of climate policies, warming slowly at limiting warming to 1.5°C or 2°C are considered here, e.g. food security. Impacts of 1.5°C mitigation pathways can be significantly higher than those of 2°C pathways, particularly in Africa and parts of Asia. But there is another trade-off: impacts of not-limiting warming at those thresholds on food security. This latter one is discussed in Ch.3 (4.5.2.1 page 83, where e.g. &quot;...&quot; constraining warming to 1.5°C rather than 2°C would avoid significant risks of tropical crop yield declines in West Africa, South East Asia, and USA America.&quot; This two issues (warming and climate policy related trade-offs) should be considered together, e.g. the 'Climate Compatible Development' concept mentioned in 5.6.1 (on page 31). Thus at least, it would be important here to mention the other trade-off mentioned, as well. [Tibor Farago, Hungary]</td>
</tr>
<tr>
<td>19639</td>
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<td>24</td>
<td>The section is problematic as it seems to assume that to get to 1.5 we will need significant CDR. This ties back to the overall concern raised in the beginning of the comments. You need to look at a range of scenarios that also include those that do not include significant CDR. You need to be looking at real numbers – see a much better treatment of this issue in chapter 3, where real numbers for EJ of energy that might possibly be produced by global ecosystems are used, in a much more realistic context of land, water, primary productivity, etc. This section should not rely on the IAM stories of the two forthcoming articles. References to include in these papers: Christopher Field and Kathrin Mach. 2017. Ruling out carbon dioxide removal. Science 359: 706-707; Sivan Kartha and Kate Dooley. 2016. The risks of relying on tomorrow’s ‘negative emissions’ to guide today’s mitigation policies. [Bruce Currie-Alder, Canada]</td>
</tr>
<tr>
<td>7972</td>
<td>23</td>
<td>30</td>
<td>23</td>
<td>31</td>
<td>Could you clarify that Chapter 2 p. 8, 20) mentions that land use changes do not differ markedly between 1.5° and 2°C. [Jasmin Kemper, United Kingdom of Great Britain and Northern Ireland]</td>
</tr>
<tr>
<td>13369</td>
<td>23</td>
<td>31</td>
<td>23</td>
<td>32</td>
<td>When referring to Figure 5.4 in text here, suggest indicating to the reader which part/panel of the figure this statement relates to (i.e. insert: 'see food security panel, Figure 5.4') [Jordan Hendriks, United Kingdom of Great Britain and Northern Ireland]</td>
</tr>
<tr>
<td>19797</td>
<td>23</td>
<td>34</td>
<td>23</td>
<td>41</td>
<td>Also compare the risks to the right to food from mitigation action to the risks to the right to freedom [Tara Shine, Ireland]</td>
</tr>
<tr>
<td>19638</td>
<td>23</td>
<td>36</td>
<td>23</td>
<td>38</td>
<td>This paper (Puydimo 2015) has unfortunately a very simplistic and understandable atmosphere policy. Look at the set of equations on p. 22 of the paper. I basically says that the magnitude of international aid to be given at addressing land competition from mitigation measure is equal to the amount of food needed times the price of that food. [Mark it would be interesting here citing the importance of perennial crops (e.g. Oliver et al, 2010). Increased food and ecosystem security via perennial grains. Science, 328(5986), pp.1638-1639.] [Gabriel de Oliveira, Brazil]</td>
</tr>
<tr>
<td>5137</td>
<td>23</td>
<td>36</td>
<td>23</td>
<td>41</td>
<td>Addressing impacts of mitigation policy on food prices will not entirely address the impacts of mitigation policy on food security, particularly for food producers who are impacted directly by mitigation policy in the land sector. How mitigation policy impacts producers as well as consumers should be considered. This relates the importance of a discussion of how (the pathways through which) mitigation policy in the land sector can negatively impact food security, e.g. land rights, competition for land and water, etc. [Tomas Rosel, United States of America]</td>
</tr>
<tr>
<td>1887</td>
<td>23</td>
<td>44</td>
<td></td>
<td></td>
<td>G4.6.3. The trade-offs described here is very critical one and some of the positive and negative interactions between the various SDGs were also mentioned in Chapter 1, not the climate action vs energy-related SDGs. That is also why important that only certain response policies and targets are highlighted e.g. in the 2030 Agenda, such as substantial increase in renewables, improvements in energy efficiency, facilitation of access to clean energy technologies etc. Thus such approaches could also be mentioned in this subsection as a 'way-out' from the trade-off between energy access and emissions mitigation policies. [Tibor Farago, Hungary]</td>
</tr>
<tr>
<td>7133</td>
<td>23</td>
<td>44</td>
<td></td>
<td></td>
<td>This respect to impacts of existing land use/policy. A recent study (Liu, et al., 2014) shows that the short-term health and psychosocial impacts of domestic energy efficiency investments in low-income areas, a controlled before and after study, BMC Public Health 17:1 (2017). 140 it shows that investing in energy efficiency is low-income communities does not lead to social reported improvements in the short-term. However, investments increased subjective wellbeing and were linked to a number of psychosocial intermediates that are conducive to better health. It is likely that better living conditions contribute to improvements in health outcomes in the longer term. [Erika Malta, Sweden]</td>
</tr>
</tbody>
</table>
### Comment No. 19708

Add a reference to the right to development. All people have the right to development and it is in the interests of all that this right is realised using clean, affordable and sustainable energy. When people have access to energy services, outcomes in fields such as health, education, economic growth and poverty reduction improved. However, traditional, fossil fuel-based energy production is a significant contributor to the greenhouse gas emissions that cause climate change, so alternative forms of energy are needed to ensure that the utilisation of energy does not exacerbate climate change. The impacts of climate change have the potential to undermine, or even roll back, development gains. Therefore energy poverty must be brought to an end by providing access to clean, renewable energy services that enable truly sustainable development and climate justice for all.  

**Response:** Accepted. We refer now also to gender implications and the changed role of women.

### Comment No. 13370

When referring to Figure 5.4 in text here, suggest indicating to the reader which part/panel of the figure this statement relates to. 

**Response:** Accepted. This figure has been replaced.

### Comment No. 19799

Do the possible role of subsidies see the use on the work of social protection to provide access to sustainable energy for the poorest. The Role of Social Protection in Promoting Green Growth and Reducing Poverty  

**Response:** Accepted. We refer now also to gender implications and the changed role of women.

### Comment No. 13489

Figure 5.4 also needs to make it clear that these implications on food security do not take into account adaptation perspectives. 

**Response:** Accepted. Some of the information of water shortage in China should be added and the following references should also be cited in the text.

### Comment No. 2316

Some of the information of water shortage in China should be added and the following references should also be cited in the text. 

**Response:** Accepted. Some of the information of water shortage in China should be added and the following references should also be cited in the text.

### Comment No. 2575

On the possible role of subsidies see work on the use of social protection to provide access to sustainable energy for the poorest. The Role of Social Protection in Promoting Green Growth and Reducing Poverty  

**Response:** Accepted. We refer now also to gender implications and the changed role of women.

### Comment No. 2585

On the possible role of subsidies see work on the use of social protection to provide access to sustainable energy for the poorest. The Role of Social Protection in Promoting Green Growth and Reducing Poverty  

**Response:** Accepted. We refer now also to gender implications and the changed role of women.

---

**Note:** The entries above are from a table and the content is extracted from the IPCC WGI SR5 First Order Draft Review Comments and Responses - Chapter 5. The entries are marked as 'Accepted' or 'Rejected' based on the responses to the comments. The comments and responses are detailed and relevant to the context of the IPCC's work on climate change and its implications.
Some of the impacts of freshwater shortage in China should be added, and the following references should also be cited in the text.


The water demands for renewable construction and bulky production could also compound existing water problems. Heavy metal mining tailings and coal waste. There needs to be caution exercised over the management of all energy sources in order to protect water supplies. Nuclear technology also has the capability of water desalination without the use of fossil fuels providing a potential solution to communities who require clean energy and water for non-energy uses. Photosynthesis can also help to back up renewables and nuclear technology is currently being used to strengthen energy systems through the use of isotope. [Michelle Leslie, Canada]

The worst furthering for a summer is understandable in the current climate. [Manes, Heflo, Canada]

Figure 3.4.5 Sustainable Development Implications of 1.5 C and 2 C Mitigation Pathways 3.4.3 Water security (energy-related) Does this section have to be limited to energy-related water issues? If not, mention of the flood mitigation value of wetlands and peatlands could be mention here. [Samantha Grover, Australia]

Accepted, we extended the discussion to the implications for other water related impacts.


Figure 5.4. As the draft indicates that this figure will be extensively added to. These not provided more detailed comments to this figure. However, a general comment for consideration when updating the content is to ensure that the visual structure is arranged appropriately so that the reader can easily navigate the data and make relevant connections in the data (There is already a lot of information in the current draft of this figure) [Jordan Hornbl, United Kingdom (of Great Britain and Northern Ireland)]

Accepted, figure has been substantially extended for 21 SD-dimensions

Some nuclear reactor designs use air cooling, or closed circuit water cooling, thereby having negligible effects on water availability. Waste heat from nuclear power plants can also be used to generate electricity. Water is being directly accessible to drinking water. The difference between "water scarcity" and "water stress" is greatly misleading. Electricity can be transmitted over grids from places that have plenty of water (especially near a coast, where desalination may be useful) to places without water. Water is hard to transport as it is quite heavy (although it does, of course, flow well); which means that water issues are always locally. Energy issues become something that an entire society has to deal with. A lot of the attraction of electricity is that it can be so easily shipped. Large-scale electricity and a robust grid mean that water and energy are not an issue in any sense of the phrase. Additionally, some models of small modular reactors would require functionally no water to operate. [Jason Donev, Canada]

Figure 3.4.5 sustainable development implications of 1.5 C and 2 C mitigation pathways 3.4.3 Water security (energy-related) Does this section have to be limited to energy-related water issues? If not, mention of the flood mitigation value of wetlands and peatlands could be mention here. [Samantha Grover, Australia]

Accepted, we extended the discussion to the implications for other water related impacts.

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Accepted, we extended the discussion to the implications for other water related impacts.
The reference to large-scale deployment of negative emission technologies need to include brief reference to associated potential risks and implications very important summary of the key issues. Incorporate human rights [Tara Shine, Ireland]

Rejected. Human rights issues should be covered in the framing sections

This sentence needs a reference. [Wilfran Moufouma Okia, France]

Noted. The sentence has been deleted, it was an unnecessary introduction to the section

It may be helpful to identify the specific SDGs that are relevant to facilitate mitigation. This would better illustrate the connections between the SDGs and a more equitable and inclusive model of development if; a) Developed countries must rapidly peak and reduce emissions while delivering their commitments to enable climate action in developing countries • This requires leadership from all countries, but this leadership differs depending on a country’s circumstance: a) All countries are enabled to participate in the transition on the same time scale. b) Zero carbon / 1.5 pathways are compatible with achieving the right to development, with a shift to Sustainable Development, poverty eradication and development must be realised for all people • Justice and development first were contested as historical experience shows development first. [St-Nicom UDDN, Australia]

Accepted. This formulation is indeed more accurate, and has been included in SOD

Climate first or development first could be contested as historical experience shows development first. [Willem Modea, South Africa]

Accepted. This formulation is indeed more accurate, and has been included in SOD

If sustainability hinders mitigation then it is by definition ‘not sustainable’ - better to write ‘where practices or approaches designed to enhance sustainability hinder mitigation’ etc. [Sawan Al-Mtairi, United Kingdom of Great Britain and Northern Ireland]

Accepted. The formulation is indeed more accurate, and has been included in SOD

2015-2025: the global investment needs to reach $60 trillion from 2015 onwards. To meet this investment need, a substantial increase in the mobilisation of finance is needed. [Elvira Poloczanska, Germany]

Accepted. A number of references have been added in the section on biodiversity and food.

South Africa faces a food security challenge and has many small-scale farmers. There is an opportunity to develop strategies that will improve food security, livelihoods, jobs creation, and nutrition. These strategies include the development of sustainable agriculture practices, the use of improved seeds and technology, and the promotion of small-scale farming. [Emily Tyler, South Africa]

Noted. The commenter seems to forget that this is a scientific fact-based assessment, which is meant serious
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<tbody>
<tr>
<td>10827</td>
<td>38</td>
<td>37</td>
<td>28</td>
<td>43</td>
<td>Margrove ecosystems are in need of a high vice (American Red Cross, Costa Rica)</td>
<td>Accepted. Reference added and section merged with 5.3 and 5.4</td>
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<tr>
<td>19842</td>
<td>38</td>
<td>38</td>
<td>26</td>
<td>39</td>
<td>Another reference critical of the over-emphasis of carbon sinks is found in chapter 4 and should be included here also: 2. Johansen, S. and R. W. MacDonald. 2016: Geospatializing with geographic information.</td>
<td>Accepted. Reference added and section merged with 5.3 and 5.4</td>
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<td>2818</td>
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<td>The benefits of improving air quality and street-level greenery levels (co-benefits of urban transport systems) are arguably higher than improving air quality by shutting down coal power plants, because of higher intake fraction. (Felix Creutzig, Germany)</td>
<td>Taken into account. The formula has been re-worked to put it in the context of the just transition discussion.</td>
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<td>I am not sure that public education may facilitate redirection of energy use choices (Tara Shine, Ireland)</td>
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<td>For sure I agree about the importance of education in the hard process to a better educated society. But I don’t think it is correct to talk about ‘low-skilled fossil fuel intensive work’, with a sort of negative meaning. For sure fossil fuel sector will die (hope so). But, all those workers are essential for our day to day life. And for sure, in some years, there will be ‘low-skilled green economy work’. So, I don’t think that’s the fair label for these people. (Dietmar Marx, Italy)</td>
<td>Accepted. Reference added and section removed and merged with 5.3</td>
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<td>Big initial impressions that this paragraph is talking about general education which gives people the opportunity to work in higher skilled jobs. If so, without reading the citations, how will this reduce the consumption of fossil fuels? It is generally known that a more educated consumer are the more their demand to consume energy increases and the more they therefore will need energy that is generated using fossil fuels. If this paragraph means education about climate change and therefore they will more practice to greener technology, which will then enable other workers to grow the green economy then this paragraph need to say that. (Nabtes Kinn, United Kingdom of Great Britain and Northern Ireland)</td>
<td>Taken into account. The point here is that energy education is key to enable decarbonization, which in turn requires education to enable adequate restructuring of the workforce. The point here is neither on the effect on demand (which is covered in the following sections given the trade-off rightly pointed by the reviewer) - the paragraph has been rewritten with explicit references</td>
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<td>This paragraph suggests that energy access and sustainable production and consumption are key SDGs and (without saying that) more important than others. That could be right. Perhaps make that even more explicit? I would guess then however that evidence and agreement is low, as there is not so much literature on that, making exactly that point. It should also be better coordinated with section 5.3 and 5.4 (Felix Creutzig, Germany)</td>
<td>Accepted. Reference added - copyedit to be completed prior to publication</td>
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<td>Should also include here switches to renewable energy as being highly correlated to ambitious mitigation (KienFriedrich Schlesauser, Germany)</td>
<td>Accepted. Added section merged with 5.3 and 5.4</td>
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<td>4231</td>
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<td>Another reference here is Creutzig, Felix, et al. Beyond technology: demand-side solutions for climate change mitigation.” Annual Review of Environment and Resources 41 (2016): 173-198 where the ARI sources for demand-side solutions are comprehensively summarized. (Felix Creutzig, Germany)</td>
<td>Accepted. Reference added - copyedit to be completed prior to publication</td>
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<td>section on conditional synergies: consider these findings from the above report: threats to the right to development can compromise the ability of persons, communities and nations – especially but not only the poorest – to achieve the overall level of welfare or resources needed to secure and protect other essential human rights, most directly, the increase in energy costs due to the funcioning of fossil fuel driven industrialisation may severely affect poor countries’ overall development prospects. Furthermore, as has been widely noted, a low- or zero-carbon future means that a large majority of the world’s fossil fuels will never be burned, potentially meaning that countries with fossil resources will have to forego revenue that otherwise could be put toward developmental objectives, along which these “abandoned assets” go a wide range of related infrastructure and human capital. While these risks from ambitious climate mitigation are real, the risks to human rights from climate impacts are qualitatively different in ways that make them much greater threats, the anticipated impacts of climate change are characterised by large scale, unpredictability, irreversibility, long time lags, and uncontrollable feedbacks. In contrast, the threats posed by mitigation activities are generally of limited scale, more predictable, are not generally marked by long time-lags, and are governed primarily by socio-economic processes under human control rather than biophysical feedbacks that are not. While the risks from a rapid phase-out are significant, they are qualitatively similar to those historically posed by other (non-mitigation) activities, including activities such as fossil fuel extraction that would increase in a business-as-usual future, this provides us with experience and existing institutions and strategies that are by no means sufficient now, but can be adapted and strengthened. society can also proceed adaptively, anticipating and preparing for the potential impacts of planned mitigation measures. Policies to ensure that those who bear losses from mitigation activities are treated equitably – policies that enable a just transition away from fossil fuels – will definitely be needed to an even greater extent in such cases.</td>
<td>Taken into account. These arguments are discussed in 5.4.</td>
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<td>Enabling developing countries to pursue economic growth to achieve higher standards of living and wellbeing (due to Hunger, Hunger et al. 2017, Bomer et al. 2018). This issue was already a core principle of the 1992 UNFCCC that endorsed to take &quot;full account the legitimate priority needs of developing countries for the achievement of sustained economic growth and the eradication of poverty together with the acknowledgement that in the developing countries the energy consumption will need to grow&quot;. (The explanation of the UNFCCC is also the basis for the Paris Agreement (PA) and the SR15 is to be prepared as a policy-relevant assessment assisting the future review of the commitments under the PA to pursue the ultimate objective of the Convention). (Tobias Fanghan, Hungary)</td>
<td>Accepted. RefFormulated with explicit reference to the UNFCCC and moved to section 5.4</td>
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<td>Much more emphasis needs to be given to this point. The challenges facing developing countries in the transition to low-carbon pathways are far greater than the challenges facing developed countries. The challenges posed by the dual demands of development and decarbonisation to forge an alternative route to rapid expansion of energy services for all, even while carbon emissions are declining. This is possible, but only with the necessary scale of international cooperation, including financial and technological support. (Tara Shine, Ireland)</td>
<td>Taken into account. Discussion of this point expanded and moved to 5.4.</td>
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2837 27 37 Review citation please [TYMON ZIELINSKI, Poland] Editorial - copyedit to be completed prior to publication

4304 27 43 53 In order to meet energy demands and take people out of poverty, people require reliable, baseload energy that is cost-effective. Current small-scale renewable power isn’t 100% reliable 24/7 and will not fully solve the problem. Additionally, back-up is often coal or gas which always comes with environmental and socio-economic costs even further from our 1.5 degree target. Rather the global community should look at different low carbon baseload options to serve as a back up to renewable installation. Additionally, government investment may be required in order to make deployment possible. [Michelle Leale, Canada] Taken into account. A discussion of the challenges posed by reliability and government investment has been added

18857 27 43 27 44 Addressing inequality can enhance climate change mitigation efforts, but taking people out of poverty may also trigger additional energy demands and emissions. This sentence is not consistent with the one stated on page 5-9 (in this chapter) in line 9 “Leave no one behind”. [Maneza Hafez, Egypt] Taken into account. This sentence is not meant to suggest that the objective of reducing inequalities should be sacrificed for meeting mitigation objectives. Rather it is meant to say that adequate policies should be adopted to align the two objectives of reducing emissions and taking people out of poverty as these two objectives are equally key for development. This is clarified in the text.

2828 27 47 48 Reverse citation please [TYMON ZIELINSKI, Poland] Editorial - copyedit to be completed prior to publication

11544 27 51 27 53 What questions are raised? This sentence is not clear [Elvira Poloczanska, Germany] Accepted. Sentence reformulated

31851 27 53 Review citation please [TYMON ZIELINSKI, Poland] Editorial - copyedit to be completed prior to publication


4237 28 18 17 Review citation please [TYMON ZIELINSKI, Poland] Editorial - copyedit to be completed prior to publication


1890 28 19 28 20 These issues are considered in the 2030 Agenda (Goal 11 and its targets), thus, it would be correct to insert such a reference here, e.g. Managing this exponential urban growth and the resulting urbanization is key to achieving sustainable development and existing alignment of urbanization patterns and the requirements for ambitious mitigation (Cobbinah et al. 2015). This issue is addressed in the 2030 Agenda and its SDG 11 includes targets for enhancement of inclusive and sustainable urbanization, and adaptation climate policies of the urban communities. Cities can... [Felix Creutzig, Germany] Rejected - To ensure readable and concise text, we do not list systematically the SDG and its targets associated to each of the argument. But the 2030 agenda is indeed one key framing of the whole report, as acknowledged in Chap 1 and section 5.1

6326 28 30 28 34 Here the issue is similar to the first one: one of the paths for mitigation could be bioenergy. But it’s fundamental that every action, every policy, every people (especially poor ones), on the other hand it brings money and power. [Ciot Marco, Italy] Accepted. References to these trade-offs have been added

17368 28 30 28 38 Accepted. The focus is only on 2nd Generation biofuels derived from primary agricultural products rather than upscaling of 2nd Generation (waste derived) or a focus on 3rd generation development (algae derived etc.) [Gavin Allwright, United Kingdom (of Great Britain and Northern Ireland)] Taken into account. Discussion of the different generation of biofuels has been included

19643 28 30 28 49 Demographic changes and urbanization trends should be considered. This chapter is not addressing this issue. [Felix Creutzig, Germany] Rejected. Chapter 3 does not consider mitigation, which is the substance of the discussion here.

4235 28 31 28 38 Important statement. A key review of 1175 studies on this topic, finding both positive and negative sustainability benefits of bioenergy/biofuels is Roberts/Abad, Cerramos, et al. “Bioenergy development: science base for policymaking remains limited.” GC3 (Bioenergy 3.9 (2017): 541-595, which could serve as a reference here. [Felix Creutzig, Germany] Accepted. Reference added, thank you

3209 28 38 28 39 Review citation please [TYMON ZIELINSKI, Poland] Editorial - copyedit to be completed prior to publication

10026 29 29 Box 1: Physical and socio-economic vulnerability differs here in many countries. Thus, more emphasis should be placed on the study of both the physical and socio-economic vulnerabilities and policy recommendations, particularly in developing countries. [Rasen-An, Turkey] Rejected. The physical and socio-economic vulnerabilities levels and policy recommendations in developing countries are not in the scope of chapter 5, but are discussed in Chap 3

13684 29 1 29 2 Could you not say Vulnerability instead of 'Climate Vulnerability' (as the other) [Ketkrk & Nguyen, Vietnam] Taken into account, and section now removed

20979 29 8 29 9 There could be more detail here on the effects of SDG on adaptation, referring back to comment of line 23. [Debra Lay, Guernsey] Taken into account. See section 5.3 and 5.9 where these arguments have been merged

3326 29 11 29 12 Accepted. Consider adding: “The ongoing urban area expansion will also consume 4% of global agricultural productivity from 2000 and 2050. This may comprise the livelihoods of millions of peri-urban farmer and will have implications for global food security and climate change.” Proceedings of the National Academy of Sciences 114.34 (2017): 9539-9544.) [Felix Creutzig, Germany] Accepted. This reference has been included thank you

799 29 14 28 28 There are 3 examples of page numbers in a citation, is this correct according to the citation format for this report? [Moshe Kinn, United Kingdom (of Great Britain and Northern Ireland)] Noted - the section 5.5 was removed but the changing context Paris and Sendai agreement is noted in 5.3

4236 29 17 Consider adding: “The ongoing urban area expansion will also consume 4% of global agricultural productivity from 2000 and 2050. This may comprise the livelihoods of millions of peri-urban farmer and will have implications for global food security and climate change.” Proceedings of the National Academy of Sciences 114.34 (2017): 9539-9544.) [Felix Creutzig, Germany] Accepted. This reference has been included thank you

1891 29 19 29 21 Since the AR6, new international agreements (Paris, Sendai the New Urban Agenda) have position development... urbanization...” Since the AR6, new international programmes and agreements (2015 Agenda, Addis Ababa Action Plan, Paris Agreement, Sendai Framework, the New Urban Agenda) have position development... urbanization... and provided essential instruments of implementation for the realization of these goals... [Felix Creutzig, Germany] Noted - the section 5.5 was removed but the changing context Paris and Sendai agreement is noted in 5.3

12719 29 28 29 28 S5.5.1: This section does not focus sufficiently on transformative adaptation as it is. If 3.1 to be a general discussion of adaptation, it would be useful to cite AR5 WGI Chap 9 on vulnerability factors in rural areas, on the particularly vulnerable livelihoods of pastoralists, mountain farmers and artisanal fisherfolk, and on observed adaptations in rural areas. [John Morton, United Kingdom (of Great Britain and Northern Ireland)] Noted. This section has been removed. 5.3 adds new references and discussion on rural and ocean adaptation and references include: Abel et al 2016 Maputo at 291; Colloff et al 2017 addressing transformative adaptation factors published since AR5.
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**Comment**

- "It is stated: "While sustainable development objectives can conflict with climate change adaptation, sustainable development is most likely to enable transformative adaptation when attention is paid to promoting equity, social justice and fairness, and participation in decision making, rather than addressing current vulnerabilities as stand-alone climate problems. The theoretical rationale or mechanisms underpinning this are not explored." This assertion is just stated as a given. It would be more convincing if a theoretical logic with empirical support was provided." [Tara Shine, Ireland]
- "This section has been removed and merged with 5.3 Gender and sustainable development." [Tara Shine, Ireland]
- "This report and this chapter has not adequately integrated and considered gender issues. Given the available gender literature on gender and climate change this is something that must be strengthened in the second order drafts." [Tara Shine, Ireland]
- "This section has been removed and merged with 5.3. Gender and sustainable development in the context of 5.1 is a focus of this review. Wider gender issues will be covered in the more comprehensive AR6. New literature has been identified and reviewed here to address this concern. The literature notes: There is a disproportionately rich literature on climate adaptation which women and children continue to bear (Cutter 2017). New gender responsive national adaptation plans are being developed (Nepal 2017) but knowledge gaps in gender and climate research remain (Schipper et al. 2017). Emerging research suggests changes to the Green Climate Fund may help also bridge this gap (Halakane et al. 2017)."

**Response**

- Accepted. New literature which highlights the way just decision making, peace and inclusive development advances the conditions for sustainable development has been included in a new section 5.3 and new references ([McCutlin et al. 2015], [Nepal, Bhandari, and Banister 2017] and [Gupta and Arts 2017])
- Rejected. Property is a normative judgment, highly educated is insufficient.
- Taken into account. Literature suggests sustainable development for transformative adaptation enables participation by local people, and is most effective when it addresses the wider socio-economic and cultural processes that inhibit inclusive and equitable decision making ([McCutlin et al. 2015], [Nepal, Bhandari, and Banister 2017] and [Gupta and Arts 2017])
- Taken into account. This section has been removed and merged with 5.3. Gender and sustainable development in the context of 5.1 is a focus of this review. Wider gender issues will be covered in the more comprehensive AR6. New literature has been identified and reviewed here to address this concern. The literature notes: There is a disproportionately rich literature on climate adaptation which women and children continue to bear (Cutter 2017). New gender responsive national adaptation plans are being developed (Nepal 2017) but knowledge gaps in gender and climate research remain (Schipper et al. 2017). Emerging research suggests changes to the Green Climate Fund may help also bridge this gap (Halakane et al. 2017)."
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<td>Use clear definition for &quot;triple-win&quot;, as the text is not fully consistent with the one on page 6 (Tara, 2016). (Elmar Kaifu, Austria)</td>
<td>Editorial – copyedit to be completed prior to publication</td>
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<td>Section 5.5.1 to be moved or introduced early on in the publication. (Lisa Lurani, United States of America)</td>
<td>Noted. The old section 5.5.1 has been removed and now features more strongly in the introduction to the section. We will continue to refine the placement of this core text and its introduction earlier in the chapter after the second order draft.</td>
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<td>consider the specific risks posed by climate action to people in developing countries and propose measures to reduce these risks – such as repopulating human rights in all climate actions (as per the Paris Agreement)</td>
<td>Taken into account. Mitigation responses inhibiting triple-win capacity for poor and vulnerable populations now discussed in section 5.5.3. Risks from specific mitigation response options upon SDGs are discussed in section 5.4.2.</td>
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<td>These sections seem to omit the crucial role played by knowledge and information systems in particular to provide and specific action on how - including concrete procedures and experiences to realize such Integrated Approaches climate development and achieve such enabling conditions.</td>
<td>Taken into account. The adaptation and mitigation linkages discussed in chapter 4. The challenge posed by the integration with sustainable development, which cannot be just an additional dimension added on to these climate responses, is more clearly acknowledged in the introduction, with reference to Folini et al. (2017)</td>
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<td>This is a good point that effective climate responses involve a combination of both mitigation and adaptation. There is a lot of literature on this subject that highlights the benefits of such an approach including the usage of renewable energy as both a mitigation and adaptation strategy, particularly in the case of small islands. However, much of this literature does not make the explicit linkage to sustainable development. It may be beneficial to conduct an analysis of how linked mitigation/adaptation is related to sustainable development, as was done for both mitigation and adaptation separately in sections 5.3 and 5.4. Only focusing on literature that links adaptation, mitigation and sustainable development excludes lessons that can be learned from the development and prioritization literature.</td>
<td>Accepted. Reference added to section 5.5 in revised chapter structure</td>
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<td>Recent literature also shows how specific climate policy, such as NDCs, demonstrate alignment with the SDG. See, for example, see, for example, Northrup, E., H. Brui, S. Lima, M. Bouje, and R. Song. 2016. &quot;Examining the Alignment Between the Intended Nationally Determined Contributions and Sustainable Development Goals.&quot; Working Paper. Washington, DC: World Resources Institute. [David Watson, United States of America]</td>
<td>Accepted. Reference added to section 5.5 in revised chapter structure</td>
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<td>Recent literature also shows how specific climate policy, such as NDCs, demonstrate alignment with the SDG. See, for example, see, for example, Northrup, E., H. Brui, S. Lima, M. Bouje, and R. Song. 2016. &quot;Examining the Alignment Between the Intended Nationally Determined Contributions and Sustainable Development Goals.&quot; Working Paper. Washington, DC: World Resources Institute. [David Watson, United States of America]</td>
<td>Accepted. Reference added to section 5.5 in revised chapter structure</td>
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<td>policy coherence and CDD are not enough on their own - human rights also need to be respected.</td>
<td>Taken into account. Policy coherence and CDD are not a goal in such a context, but necessary conditions to safely human rights. The analysis has been refocused on integrated approaches to the enabling conditions. It includes explicitly the need to hear the voice of all actors as a way to ensure a process that respects the human rights. See the section 5.5.5 revised chapter structure.</td>
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<td>Refocusing to avoid the similarity in the literature. (Ahmed Zobaa, United Kingdom (of Great Britain and Northern Ireland))</td>
<td>Accepted. Sentence removed.</td>
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<td>There is a page number in this citation, is this correct according to the citations format for this report?</td>
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<td>Reference, After Mitchell and Maxwell 2010 there is :1 - this is a reference format error.</td>
<td>Editorial – copyedit to be completed prior to publication</td>
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<td>In India, the UK and even in Edmonton, Alberta, waste to energy plants are energy as a means of taking waste that would normally end up in landfills and reducing that waste.</td>
<td>Rejected. Thank you for the recommendation, however our assessment must focus upon the published peer-reviewed literature where possible.</td>
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<td>Reverse citation (please (TYMON ZIELIŃSKI, Poland)</td>
<td>Editorial – copyedit to be completed prior to publication</td>
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<td>Refer also to the critique and concerns regarding CSA (e.g., Neufeldt et al. 2013; Cocks and Drouet, 2006; Neufeldt et al., 2013) for their comprehensive analysis of how linked mitigation/adaptation is related to sustainable development.</td>
<td>Accepted. Reference added to section 5.5 in revised structure of the chapter</td>
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<td>Discussion of climate-smart agriculture as a potential triple-win benefit from elaboration to the reference to &quot;mixed outcomes.&quot; Much of the discussion of climate-smart agriculture focused on biophysical aspects of agriculture, on practices and hard science — with little attention to the imperative of addressing inequality and inequity in food systems, that put small-scale food producers (and particularly women) at a disadvantage, making the &quot;triple-win&quot; less for them. To what extent does the literature cited discuss the role of addressing inequality in the context of climate-smart agriculture as a necessary (even not sufficient) element of that paradigm?</td>
<td>Accepted. Mixed outcomes has been elaborated and supported by the following references in section 5.5.5 (in revised chapter structure and Mitchell et al. 2015; Climate-smart agriculture: what is it good for?) The Journal of Policy Studies. Chandra et al. (2017) The relevance of political ecology perspectives for smallholder climate-smart agriculture; a review, Journal of Political Ecology, 24, 421-462</td>
</tr>
<tr>
<td>19844</td>
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<td>Include also Neufeldt et al. 2013. Beyond climate-smart agriculture: towards safe operating spaces for global food systems. Agriculture &amp; Food Security 2:1 2013.</td>
<td>Accepted. Reference added to section 5.5 in revised structure of the chapter</td>
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<td>10885</td>
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<td>Integrating knowledge and insights into non-linear ecosystems' behaviour is vital to inform cost-effective and efficient progress towards achieving multiple-win outcomes (Siat et al. 2017). In particular, linking non-linear system behavior to an economic evaluation of intervention options facilitates better understanding of opportunities and challenges for cost-effectively delivering both climate and development objectives (Siat et al. 2017).</td>
<td>Rejected. The cited article is more appropriate for Chapter 4 which examines the requirements for enhancing institutional capacities (including financial and investment arrangements) for transformative change.</td>
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IPCC WGI SR15 First Order Draft Review Comments And Responses - Chapter 5

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<td>19816</td>
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**Comment**: Section on triple wins - the wins also need to be articulated in terms of equity, justice and rights. [Tara Shine, Ireland]


---

**Comment**: In different sections there is talk of a body of literature on co-benefits and synergies, empowering development options while mitigating and adapting to climate change. I think a table with examples across regions or sectors would be informative and would reflect existing literature in an encouraging way. For a regional example in China and irrigation development policies for co-benefits between adaptation and mitigation, I suggest to assess this reference: "Chenadaz, Roger; Rothauser, Sabrina GSA; Conway, DROLLER; Zuo, Xiaoxia; Wang, JIN; Liu, YUN (2016). Co-benefits and trade-offs in the water–energy nexus of irrigation modernization in China. Environmental Research Letters, 11(5)." In the paper, it is shown that taking into account regional context is key to provide co-benefits, and that top-down approaches ignoring local factors fail to provide co-benefits; it is also shown that the selection of technologies and practices for adaptation requires local knowledge to avoid choices leading to trade-offs between adaptation and mitigation. Roger Chennadaz, Germany

**Response**: Accepted. We use the reference to stress the importance of bottom-up approaches to maximize synergies (in now in section 5.5 in revised chapter structure).

---

**Comment**: Need to emphasize the dislocation of emission attribution caused by international trade and globalized production chains [Gavin Allwright, United Kingdom (of Great Britain and Northern Ireland)]

**Response**: Rejected: beyond the scope of this section

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**Response**: Accepted: reference and point added in the text (section 5.5 in revised chapter structure)

---

**Comment**: Important to articulate a clear comparison of the risks / tradeoffs and how they can be avoided / mitigated - e.g. The risks posed to human rights by climate-change are significant and would undermine progress on poverty reduction to date. This is an injustice we cannot allow to happen: acting now to phase out carbon emissions to zero is fully compatible with eradicating extreme poverty and achieving sustainable development, a commitment to integrate human rights and equity into all climate policies and to design policies to maximise the potential for positive co-benefits including improved health, decent work, sustainable food production and access to renewable energy, can ensure that Zero poverty and Zero emissions are win-win goals for the global majority. [Tara Shine, Ireland]

**Response**: Rejected: This is beyond the scope of section (earlier in section 5.5 now 5.6 in revised chapter structure) and pertains to the overarching purpose of the Special Report.

---

**Comment**: In different sections there is a body of literature on co-benefits and synergies, empowering development options while mitigating and adapting to climate change. I think a table with examples across regions or sectors would be informative and would reflect existing literature in an encouraging way. For a regional example in China and irrigation development policies for co-benefits between adaptation and mitigation, I suggest to assess this reference: "Chenadaz, Roger; Rothauser, Sabrina GSA; Conway, DROLLER; Zuo, Xiaoxia; Wang, JIN; Liu, YUN (2016). Co-benefits and trade-offs in the water–energy nexus of irrigation modernization in China. Environmental Research Letters, 11(5)." In the paper, it is shown that taking into account regional context is key to provide co-benefits, and that top-down approaches ignoring local factors fail to provide co-benefits; it is also shown that the selection of technologies and practices for adaptation requires local knowledge to avoid choices leading to trade-offs between adaptation and mitigation. Roger Chennadaz, Germany

**Response**: Accepted: reference details have been changed accordingly.

---

**Comment**: More detail information on stakeholders’ analyses and their role will help to put in context. For example: what the government has done? [Perdinan Perdinan, Indonesia]

**Response**: Accepted. Original sentence replaced - Please note that in revised chapter structure this is now in section 5.5.

---

**Comment**: I believe the three references cited are now published as book chapters in F. Nunan (ed.) Making Climate Compatible Development Happen, Routledge, 2017, as we should be more visible. [Roger Cremades, Germany]

**Response**: Accepted. The sentence has been deleted.

---

**Comment**: Information above is from: Zero Carbon Zero Poverty: Achieving an equitable phase-out of carbon emissions by 2050 while protecting human rights. Mary Robinson Foundation, 2015 [Tara Shine, Ireland]

**Response**: Accepted. The sentence has been deleted.
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<td>19817</td>
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<td>Also compare the risks to human rights from climate impacts to the risks posed by human rights a carbon phase-out rapid enough to ensure warming likely to stay below 2°C will require extremely ambitious mitigation action in both rich and poor countries. The risks to human rights from mitigation activities are very real, and indeed some are already being witnessed at much lower scales of mitigation than would be needed for a rapid carbon phase-out. Notably, policies to promote hydroelectric power, to use agricultural land for bioenergy feedstock production, and to designate forest reserves on indigenous land have already demonstrated the potential for human rights violations driven by mitigation efforts.</td>
<td>Rejected: This is beyond the scope of the section - Trade-offs between mitigation pathways and sustainable development dimensions are discussed in section 5.4.5.</td>
</tr>
<tr>
<td>2002</td>
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<td>38</td>
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<td>See also the State of the Tropics 2014 report and associated references at stateofthetropics.org [Stewart Lockie, Australia]</td>
<td>Thank you for the reference. Here, the purpose is not to make an extensive assessment of the impacts of climate change and associated activities on human rights.</td>
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<td>9067</td>
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<td>The ‘Tropics’ are not used for generalization purposes, but as an illustration (a) 460-1035 Mha of marginal lands (definition of marginal land is in section 5.4) as these are ‘waste’ and therefore could be transformed into more productive land use. (b) 1400 Mha through transitioning to vegetarian or vegan (this of course needs to keep in mind that free allocation between the land types are not always possible). (c) 1400 Mha through elimination/reduction of food waste (complete elimination across the whole food chain will likely never be possible but attempting to cut food waste in half would already free a significant amount of land).</td>
<td>Accepted. Reference added to section 5.5 in revised structure of the chapter</td>
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<td>2003</td>
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<td>The comments are certainly one consequence of land competition, I would have expected this chapter to look more broadly at the sustainable development dimension, poverty reduction, inequality and equity implications of pressures to switch land uses out of food production towards mitigation – impacts on livelihoods and social developments, and the role of human rights, including the role that free allocation between land types is – there is a limited need for land use for climate change mitigation and the discussion [Dinesen Stalnaker, United States of America]</td>
<td>Rejected. This is beyond the scope of the section - Trade-offs between mitigation pathways and sustainable development dimensions are discussed in section 5.4.5.</td>
</tr>
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<td>2004</td>
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<td>The part corresponding to the “reactive coping strategies” is here: (at page 100 of the paper), “There were some households that have chosen to develop forests for financial gain or as a short-term coping strategy, even though they acknowledged the importance of forest as a safety net (NITF sources) for themselves and other indigenous people” [Mikato Ebara, Japan]</td>
<td>Accepted - copedit to be completed prior to publication</td>
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<td>Food prices are certainly one consequence of land competition. I would have expected this chapter to look more broadly at the sustainable development dimension, poverty reduction, inequality and equity implications of pressures to switch land uses out of food production towards mitigation – impacts on livelihoods and social developments, and the role of human rights, including the role that free allocation between land types is – there is a limited need for land use for climate change mitigation and the discussion [Dinesen Stalnaker, United States of America]</td>
<td>Tackled into account. We have added some additional critical literature on climate-smart agriculture and trade-offs between land-based mitigation and sustainable development dimensions in section 5.5. Section 5.4 also discusses synergies and trade-offs between land-based mitigation and sustainable development dimensions.</td>
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<td>The feedback on the word “corrected” should be “connected” [Samantha Grover, Australia]</td>
<td>The word “corrected” should be “connected” [Samantha Grover, Australia]</td>
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<td>The comments are certainly one consequence of land competition. I would have expected this chapter to look more broadly at the sustainable development dimension, poverty reduction, inequality and equity implications of pressures to switch land uses out of food production towards mitigation – impacts on livelihoods and social developments, and the role of human rights, including the role that free allocation between land types is – there is a limited need for land use for climate change mitigation and the discussion [Dinesen Stalnaker, United States of America]</td>
<td>Accepted - copedit to be completed prior to publication</td>
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<td>Important to capture the inequality risks of a poorly managed or urban transition to 1.5 pathways. For a transition to Zero carbon to be successful all countries must undertake it together. Developing the countries are home to the majority of the world’s poor people in the world and have less fossil fuel based infrastructure to diversify from than developed countries, largely due to the development deficit. Developing countries also face the same climate risks and adaptation costs, even in a 2°C world, as a result the majority of climate action will need to take place in developing countries and must be supported by the international community. If the global transition required to avoid dangerous climate change cannot be achieved, development requires energy, but not carbon intensive, the right to development of people in developing countries requires that they have access to alternative sources of energy to develop and lift themselves out of poverty. It is unreasonable to expect developing countries to reduce emissions on their own at an equivalent stage of development to when rich countries were drastically increasing theirs. the only feasible way to achieve this is through the provision of support, both financial and technological, from those countries with greatest capacity.</td>
<td>Rejected: Beyond the scope of the section. Discussed in section 5.5 and also in section 5.4.</td>
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<td>1</td>
<td>Can’t the Tropics really be generalized like this? [Elvira Poloczanska, Germany]</td>
<td>The Tropics are not used for generalization purposes, but as an illustration</td>
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<td>Thank you for your reference. Here, the purpose is not to make an extensive assessment of the Tropics, but only to use this as an illustrative example.</td>
<td>Accepted - copedit to be completed prior to publication</td>
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<td>Figure 5.3: Explain the acronym. [Jorien Harrell, United Kingdom (of Great Britain and Northern Ireland)]</td>
<td>Figure deleted.</td>
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<tr>
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<td>Figure 5.4: The acronym replaces - suggests the results explaining it important, and could perhaps be simplified it not. [Jorien Harrell, United Kingdom (of Great Britain and Northern Ireland)]</td>
<td>Figure deleted.</td>
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One way of overcoming these siloes is through a climate justice approach which links climate change, development and human rights to place people at the centre of climate decision making. [Tara Shine, Ireland]

• To address the context of sustainable development and the sustainable development objectives 'trade-off' in this context ‘sustainable development’ seems to mean ‘economic development’. [Takahiro, Japan]

- To produce various forms of lock-in that are highly resistant to change and that can produce seemingly intractable trade-offs between climate and development objectives. Farago (2016) highlights that such inertia is typical for the fossil fuel based energy and transport systems, partially because of the lock-in effects and to some extent, such inertia characterises certain agricultural and industrial sectors, as well. Farago T., 2016: The anthropogenic climate change hazard: role of precedents and the increasing science-policy gap. 167|168 (ISSN 0324-8394); 160; 1; 1–40 http://dx.doi.org/10.1007/s10589-015-1228-4.] [Tibor Farago, Hungary]

- Section 5.7 seems to repeat material in section 5.1.4 and 5.7.2 overlaps with 4.4.1. [Koko Warner, Germany]

- Figure 5.9: Unclear what the alternating blue and orange bands represent in the middle of the figure - needs explaining if important, and could perhaps be simplified if not. [Jordan Hartley, United Kingdom (of Great Britain and Northern Ireland)]

- This is an important statement re the need to emphasise equity and justice - it is also important to say 'how to' achieve greater equity and justice. Respect for human rights and gender equality in all climate actions as per the Paris Agreement is a fundamental part of this. Equally important for fairness is the provision of adequate financial, technical and capacity support to developing countries to enable them to fully participate in the transition to a 1.5°C pathway. An unjust transition where rich countries move ahead towards a green economy and less well off countries are left to rely on dirty fossil fuels with further deepening existing inequalities. Some more on these 'how's' in the box below. [Tara Shine, Ireland]

- 1) Act now - a carbon phase out must begin quickly and extend globally in order to be effective. This ambitious global transition to Zero carbon requires that:
  - All Parties to the UNFCCC adopt the temperature goals set in the 2015 Paris Agreement and undertake to, in all climate actions respect human rights for all;
  - All countries engage in pro-poor low carbon development, with a focus on pre-2020 climate action to ensure that the peak in global emissions is as soon as possible [and no later than 2020];
  - Countries with the capacity to do so accelerate the provision of climate finance whilst protecting and increasing their aid budgets to enable pro-poor, low carbon and climate resilient development in all countries;
  - Private sector investment is redirected away from fossil fuel intensive industries and towards sustainable alternatives. Investment in clean, renewable technologies can close the global infrastructural gap in agriculture, transport, energy and water sectors;
  - All countries must be enabled to take part in the transition to Zero carbon. Zero poverty on the same timescale as the majority of climate action must occur in developing countries, and all countries must be part of the transition, a fair phase out goal requires:
    - The international community to provide financial support for climate actions and a wide range of "fast transition" activities in developing countries, support for mitigation must not come at the expense of support for poverty reduction, adaptation, or compensation for loss and damage, even the most rapid possible phase-out will not eliminate climate impacts and the most vulnerable need to be protected.
    - For contributors to climate action by all countries – all countries must do their share and all countries must increase their ambition over time.
    - Universal access to the necessary low-carbon technologies be made available through appropriate rules and mechanisms relating to innovation and intellectual property.
  2) Democratic processes at all levels will be necessary to enable an equitable and inclusive carbon phase-out that protects human rights. Access to information and participation in decision-making are fundamental human rights, essential for the protection of other rights. Governments should:
    - Dramatically increase investment in education, participation, access to information and capacity building, as mandated in Article 6 of the UNFCCC, and Principle 10 of the Rio Convention, to engage people around the world in climate action and sustainable development;
    - Strengthen the participation of a broad range of stakeholders in climate and sustainable development policy at all levels, including subnational and local government, business and civil society, including youth, persons with disability, women and indigenous peoples;
    - Ensure that policies to achieve a carbon phase-out are gender-sensitive and empower women as actors in climate action, poverty eradication and sustainable development;
    - Implement participatory rights and dispute resolution mechanisms, at international and national level, to limit the influence of vested interests in climate policy and address any human rights violations arising from climate actions. [Tara Shine, Ireland]

- Taken into account. Points that are relevant to the discussion on integrated approaches are captured in the discussion on enabling conditions, which forms the organizing principle of the revised section.

- The literature has been integrated where appropriate. One of the FAQs also discusses welling up, equity, and rights in the context of the CRDPs.
1983 35 16

Given the report’s mandate to assess the knowledge on 1.5°C compatible pathways - a given the report’s mandate to assess the impacts of global warming of 1.5°C above pre-industrial levels and the knowledge related global greenhouse gas emission pathways - (explanation: both elements of that mandate are important when the climate-realized development pathways are evaluated, so the proposed amendment corresponds to the mandate asked to by IPCC AR5 (2014)) [Tibor Farago, Hungary]

The introduction has been rewritten and this sentence is no longer part of the text.

2318 35 16 35 18

Refraining to avoid the similarity in the literature [Armed Jones, United Kingdom (of Great Britain and Northern Ireland)]

The introduction has been rewritten and this sentence is no longer part of the text.

1994 35 21

"emphasis on development, resilience, and " emphasis on sustainable development, resilience, and (explanation: the 2030 Agenda is on the sustainable development goals and includes targets, instruments for the transformation towards sustainable development) [Tibor Farago, Hungary]

The introduction has been rewritten and this sentence is no longer part of the text.

801 35 21 35 21

It states "foregrounding the intrinsic emphasis on development" perhaps clearer English could be used, as this report is also for layman and policy makers. [Moxie Kim, United Kingdom (of Great Britain and Northern Ireland)]

The wording has been amplified.

1995 35 22 35 23

These pathways are fossilized - a "These CREDs are fossilized" (explanation: Obviously, under "These pathways" not those pathways are meant here which described by the 2030 Agenda (through goals, targets, instruments) which agendas is mentioned in this prev. sentence. Those are already not fossilized development pathways as compared to various other UN-related development programmes: e.g. during the Development Decade or those meant in context of " Financing for Development process".) [Tibor Farago, Hungary]

This sentence has been modified. It refers specifically to CREDPs, and so does the entire paragraph.

19825 35 28 35 29

human rights must be included with equity, fairness and justice as the international frameworks which provide a norm for respect for the supply of legal responsibilities with which to frame morally appropriate responses to climate change, rooted in equity and justice.

The idea of human rights point associates towards internationally agreed values around which common action can be negotiated and then acted upon. Human rights principles deliver valuable moral thresholds, legally defined, about which there is widespread consensus. The guarantee of basic rights rooted in respect for the dignity of which person is at the heart of this approach makes it an indispensable foundation for action on climate justice. (from the Principles of Climate Justice www.mrfcj.org) [Tara Shine, Ireland]

The updated text now makes stronger reference to equity, fairness, justice, and rights. This text appears to be redrafted.

2000 35 41 35 42

Newry: Climate Change in Newry

Copied and pasted to be completed prior to publication of the report.

19826 35 43 35 46

The juxtapositions associated with mitigation options range from inequitable access to sustainable particles to human rights. A global phase-out of carbon emissions can only work when it is done fairly and as part of sustainable development. A human rights approach provides the framework necessary for success. Zero Carbon, Zero Poverty would not only avert a catastrophic future but would precipitate a transition to a more equitable future defined by a social and international order in which the rights and freedoms set forth in the universal Declaration of Human rights, including freedom from poverty, are realized. Is that, after all, a world-everyone is entitled to. [Tara Shine, Ireland]

The updated text now makes stronger reference to equity, fairness, justice, and rights. This text appears to be redrafted.

2007 35 46

Reviewers' section please [TYMON ZIELIŃSKI, Poland]

Copied and pasted to be completed prior to publication of the report.

19827 35 47 35 49

The "how to" for the vision of society inclusive, equitable pathways to 1.5 is through a commitment to human rights (including for example the right to development and the right to participation for all people and communities), a commitment to gender equality and a commitment to fairness (every country doing their fair share and supporting less developed countries to deliver their climate ambitions) [Tara Shine, Ireland]

The updated text now makes stronger reference to equity, fairness, justice, and rights. This text appears to be redrafted.

19829 35 47 35 49


Thank you.

13290 35 49 35 50

I am not sure if the term "unravelling" is used correctly whether it is a typo in "whose environment future are we pursuing and which pathways?" [Traidal Davis, Canada]

The typo has been fixed.

14159 35 50 35 51

One, however, 1. The strength and salience of values in individuals is influenced by the relative strength of those values in wider society (Kasser et al 2004; Uzzi & Braveman 2000).

Two. People hold multiple values but may have dispositional tendencies to prioritize some values above others. People are not rigidly fixed in their value orientation, and can be influenced, or primed, into activating certain values.

Four. People seem to make trade-offs between values within an integrated system of values, so a particular behavior may be in line with one value but because it in conflict with others it is not enacted.

In other words, it is way more complex than implied here. [Eliza Poloczanska, Germany]

These are important points and have expanded attention to different values and trade-offs, also in the FAQ2.

19847 35 3

Doisneau and Coveryot (2015) not in reference list. [Jorgen Stabnik, United States of America]

The reference has been added.

19830 36 6 36 10

This is a critical point and can be supported by a wider literature then indicated in the FAQ. Research by the Mary Robinson Foundation - Climate justice shows a steep increase in the amount of academic publications on climate justice from 2008 to the present - with the number of disciplines engaging with the issue also increasing to over 15 disciplines ranging from science, law, sociology and philosophy to geography, international relations, gender studies and health. Some examples are listed below. [Tara Shine, Ireland]

Many thanks for the references, provided below. We have used several in the updated text.

19831 36 6 36 10

e.g. Rowan, D and Sadik, C. Climate Justice an introduction, 2017. Routledge. [Tara Shine, Ireland]

Reference considered by the team.

19832 36 6 36 10


Reference considered by the team.

19833 36 6 36 10


Reference considered by the team.

19834 36 6 36 10


Reference considered by the team.

19835 36 6 36 10


Reference considered by the team.

19836 36 6 36 10

See Journal of Development and Environment rights for a literature on climate justice. [Tara Shine, Ireland]

Reference considered by the team.

19837 36 6 36 10


Reference considered by the team.

19838 36 6 36 10


Reference considered by the team.

19839 36 6 36 10


Reference considered by the team.
This figure has been removed.

This figure has been removed.

This figure has been removed.

Comment | Response |
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2014 7 36 10 | J. The red shapes in the inner circle represent the need to reduce those emissions, to deal with mitigation. Concerning transformation and resilience, these are parts of the most general commitments. 2nd para of Agenda: 'We are determined to take the bold and transformative steps which are urgently needed to shift the world onto a sustainable and resilient path.' Beyond these aspects of resilience mentioned under the SDGs, it is extended also to technologies (para. 9) and their climate-sensitivity, to biodiversity (para. 33). Ecotone, wildlife, thus resilience is not only for the under water. Therefore, I propose to replace that long sentence e.g. with the following: The 2030 Agenda addresses transformation and resilience in general, and also in relation to many specific areas. (I) T. Paragao, Hungary | Many thanks for the references provided below. We have used several in the updated text. |
19843 36 39 45 | Human rights (including gender equality and procedural rights such as the right to participate) must be part of the enabling conditions for CRDPs. It is consistent with both Agenda 2030 and the Paris Agreement and can help to capture synergies between the two. (Tara Shine, Ireland) | We use case studies that are state-led and community-led to show opportunities and challenges, and differences between developed and developed countries, but not per climate type, although we have one case study for dyplomatic. |
19844 36 53 55 | Look at the work of OECD and partnerships on secure energy data planning and decommissioned climate finance to show the value of local level decision making and action on climate. (Tara Shine, Ireland) | We have significantly modified this section, with some generic elements upfront and concrete lessons learned highlighted later through case studies. |
19845 36 17 | Section S.7.2.1 is conceptually opaque. Key terms in this section (pathway thinking and 'social foundation') need definition or redefinition/reformulation. I favour recontextualisation. The argument that human rights, political participation etc. are essential to sustainable development is self-evident (since they are among the goals of sustainable development) and can be put in a much more straightforward manner, with no need to introduce new terms such as pathway thinking. From there, I think it is important to outline how human rights etc. support other dimensions of sustainability while also acknowledging the world's diversity of political cultures. (Stewart Lockie, Australia) | We have considered this reference in our ‘Climate Justice, equity, fairness, and rights’ section. |
19846 36 9 13 | There is an important growing literature on climate justice in urban contexts to draw on here. Authors might include considering the gray literature of organizations like 350.org and Stationmasters International and the Asian Coalition for Housing Rights. (Tara Shine, Ireland) | We have more literature now on justice. Some elements are now included in a cross-chapter box on cities. |
2030 36 15 | plaza.changingwillingness.risk_taking_PTYMON/ZIELISIeki_Poland | Reference considered to be completed prior to publication of the report. |
19847 36 15 31 | Human rights are an essential and legally grounded element of the social foundations described in this paragraph. In fact many of the social foundations mentioned several times in the Agenda 2030 and once in the Paris Agreement. We take more about rights and equality through the case studies, but not specially about gender. (Tara Shine, Ireland) | We have more literature now on justice and rights. . Thank you. We now have a stronger focus on Justice, efficacy, fairness, and rights. |
2015 36 16 | 2016 Reference considered by the team. | This section has been modified to be more focused. |
2016 36 16 | The reference to social economics requires some explanation or contextualisation. (Emily Taylor, South Africa) | The reference to social economies requires some explanation or contextualisation. (Emily Taylor, South Africa) |
13376 36 32 37 | Figure 3.8: Unclear what the red shapes in the inner circle represent - suggest explanations in important or amplification of red. (Jordan Harold, United Kingdom (of Great Britain and Northern Ireland) | This figure has been removed. |
13377 36 32 37 | Figure 3.9: May be difficult for readers to make sense and navigate the figure. Weighting text size for titles can provide a useful indicator of the hierarchy of information and help to guide the reader. (Currently all text in figure appears to be the same font size, so difficult to know what to look at first) (Jordan Harold, United Kingdom (of Great Britain and Northern Ireland) | This figure has been removed. |
13378 36 32 37 | Figure 3.10: A figure bearing this heading (in addition to the caption) to highlight the key message of this figure would be useful. (Jordan Harold, United Kingdom (of Great Britain and Northern Ireland) | This figure has been removed. |
13379 36 32 37 | Figure 3.11: Some text labels, arrows, and key information and footnotes not included in the figure legend. Suggest including to aid reader comprehension. (Jordan Harold, United Kingdom (of Great Britain and Northern Ireland) | This figure has been removed. |
Comment No | From Page | From Line | To Page | To Line | Comment | Response
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11486 | 37 | 35 | 37 | 35 | Reference to rights missing - for an overview of how rights can provide important enabling conditions for CRDPs see the work of the Office of the High Commissioner for Human Rights and the table on renewable energy and human rights on the website of the Human Rights and Business Resource Centre. See also Mary Robinson Foundation (2015) Rights for Action. [Tara Shine, Ireland] | This figure has been removed.
2812 | 37 | 35 | 37 | 35 | Figure 5.5: This graph is difficult to follow, the concept is vague and letters are too small. [TYMON ZIELIŃSKI, Poland] | This figure has been removed.
19850 | 37 | 47 | 37 | 54 | Significant gaps and RECOs are evident in the evidence to show that there is no valid evidence to directly link the pace, region, speed and scale of decision making - when local communities are given a voice in decision making the results are usually negative for both the community and the project developer. See the literature of Human Rights networks and the table on renewable energy and human rights on the website of the Human Rights and Business Resource Centre. See also Mary Robinson Foundation (2015) Rights for Action. [Tara Shine, Ireland] | This sentence has been removed.
19848 | 38 | 1 | 38 | 11 | Reference to rights missing - for an overview of how rights can provide important enabling conditions for CRDPs see the work of the Office of the High Commissioner for Human Rights and the table on renewable energy and human rights on the website of the Human Rights and Business Resource Centre. See also Mary Robinson Foundation (2015) Rights for Action. [Tara Shine, Ireland] | We have more literature now on rights and will extend this reference for the final governmental draft.
2962 | 38 | 7 | | | [TYMON ZIELIŃSKI, Poland] | Copiediping to be completed prior to publication of the report.
2963 | 38 | 18 | 38 | 19 | [TYMON ZIELIŃSKI, Poland] | Copiediping to be completed prior to publication of the report.
2964 | 38 | 24 | 38 | 25 | [TYMON ZIELIŃSKI, Poland] | Copiediping to be completed prior to publication of the report.
19849 | 38 | 31 | 38 | 45 | Participation and inclusion in climate policy making are principles of climate justice (see www.ren.org). The opportunity to participate in decision-making processes which are fair, accountable, open and transparent is essential to the growth of a culture of climate justice. The voices of the most vulnerable to climate change must be heard and acted upon. A basic of good international practice is the requirement for transparency in decision-making, and accountability for decisions that are made. It must be possible to ensure that policy developments and policy implementation in this field are seen to be informed by an understanding of the needs of low-income countries in relation to climate justice, and that these needs are adequately understood and addressed. | The section has been modified but does discuss co-production of policy and inclusive governance, partnerships etc. (see under 5.6.4)
19851 | 39 | 1 | 39 | 10 | Suggest referencing examples of where local community engagement / ‘owner’s engagement in climate action has led to positive outcomes for the community and the planet’. These examples may also inform additional case studies. See Mary Robinson Foundation (2015) Rights for Action. Also Mary Robinson Foundation, Women’s participation: an enabler of climate justice. [Tara Shine, Ireland] | Local engagement and gender is now discussed in currently addressed in 5.3 and 5.3.2
14160 | 39 | 5 | 39 | 5 | | Rather ‘place-based communities’ or ‘communities of place’? However, the terms should be defined here, and the relevance of the distinction - communities of practice and place - to COP21 should be explained. [Elena Pinto-Pereira, Germany] | We have kept the terms as they are self-evident. No literature that looks at pathways makes a clear distinction.
6619 | 39 | 7 | 39 | 10 | This presentation of ‘socially acceptable’ and ‘market-oriented’ as opposites suggests that they are mutually exclusive - that market-oriented pathways could be socially acceptable and vice versa. This is an amplification which is problematic as it plays into ideological positions that are perhaps unhelpful. [Emily Tyler, South Africa] | The wording has been modified.
2965 | 39 | 10 | | | [TYMON ZIELIŃSKI, Poland] | Copiediping to be completed prior to publication of the report.
12111 | 39 | 13 | 43 | 35 | Cross-referencing Ch4. | We have cross-referenced Ch4.
18775 | 39 | 23 | | | [Tara Shine, Ireland] | This is the page number, not an error.
6598 | 39 | 34 | 39 | 36 | The concept and approach of de-growth is also a very contested one (not only as it is also subject to many contradictions and limitations) starting from the fact that degrowth is often referred to reducing GDP growth which is precisely a notion that needs to be contested in the first place as a measure of welfare. If degrowth refers only to this monetary measure this is indeed a very insufficient and of little use for the climate debate. I guess the authors may want to refer to it also as a degrowth of materials or emissions, but in any case, unless much more elaborated, I am not sure how much this fits in the overall report or contributes to the various narratives being developed in the report (of course there will have to be a degrowth in some sectors, trends, patterns of consumption, etc., to meet the 1.5°C challenge, but at the moment it is unclear what it refers to or how to make its possible). [J. David Tabala, Spain] | We have refined the wording – it now makes more specific regarding ‘legitimate de-growth beyond GDP reduction, with some additional references.
2899 | 39 | 36 | | | [TYMON ZIELIŃSKI, Poland] | Copiediping to be completed prior to publication of the report.
14307 | 39 | 38 | 39 | 38 | Major may want to define the term ‘Global South’ [Jason Deyer, Canada] | Copiediping to be completed prior to publication of the report.
15011 | 39 | 43 | 39 | 43 | Significant number of papers refer to the Global South. IEG is using ‘emerging green states’ without deeper discussion of each country’s mitigation/adaptation profiles. Referencing Scandinavian countries in the same sentence also seems out of place, as these countries have a very different set of characteristics and emissions profiles [Farhan Ahsame, United States of America] | We no longer place these together in the same paragraph. We maintain the disclaimer on the term ‘emerging green states’ but do not have the space to enter into details about nation AM profiles.
2970 | 39 | 43 | | | [TYMON ZIELIŃSKI, Poland] | Copiediping to be completed prior to publication of the report.
2971 | 39 | 49 | 39 | 50 | [TYMON ZIELIŃSKI, Poland] | Copiediping to be completed prior to publication of the report.
12685 | 40 | 1 | 40 | 1 | These boxes are good (but where is 5.3?) but how do they relate to 1.5? [Lisa Schipper, Vietnam] | We have regrouped the case studies in the boxes. The purpose is to explore aspects of CRDPs that are relevant for fair and equitable 1.5C warmer worlds. There is very limited literature that is 1.5C specific.
18776 | 40 | 7 | 40 | 7 | The URL is a dead link [Wilfran Moufouma Okia, France] | This reference has been removed.
<table>
<thead>
<tr>
<th>Comment No</th>
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<tr>
<td>5090</td>
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<td>26</td>
<td>The Brice Verde and Brice Foretamente experiences, however interesting, were not expanded beyond the data recorded in the text and the new government determined its end. [Cristiano Desconcis, Brazil]</td>
<td>Thank you. Text was modified accordingly.</td>
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<td>14308</td>
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<td>nostalgia to looking at cutting nuiner, which will almost certainly be their GFDs estimires. This may be a bad example to grab. [Jason Doreno, Canada]</td>
<td>We have removed this case study.</td>
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<td>14309</td>
<td>41</td>
<td>1</td>
<td>41</td>
<td>1</td>
<td>There appears no text after the leading other than Box 5.3.7 If Eio is in a subsection of the chapter, there should be a section here describing the different contexts globally under state-NGO-community mechanisms for resilient pathways. Given the amount of funding that has gone into climate resilience initiatives globally, there should be no shortage of examples here. [Johanna Nalau, Australia]</td>
<td>There is now text before the boxes/case studies.</td>
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<td>12967</td>
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<td>3</td>
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<td>54</td>
<td>While the Box 5.3.5 describes one NGO-initiative context, this is a very limited view of Vanuatu's adaptive capacity and the challenges in the country in terms of sustainable development and adaptation. Firstly, given Tropical Cyclone Pam, the first recorded category 5 cyclone in Vanuatu, put back the country from graduating its LDC status (UN General Assembly gave Vanuatu to 2020 to graduate). Secondly, Vanuatu has been a forerunner in institutional integration, being the first country in the Pacific to constitute a National Adaptation Board (NAB), which deals with climate adaptation and disaster risk reduction. See: Nalau, J., Handmer, J., Dalesa, M., Foster, H., Edwards, J., Kaushina, H., Wagemann, S., (2015). The practice of integrating adaptation and disaster risk reduction in the south-west Pacific. Climate and Development, 1-11; Handmer, J., &amp; Iveson, H. (2017). Cyclone Pam in Vanuatu: learning from the low death toll. Australian Journal of Emergency Management, 32(2), 60-69. It would be more useful in the context of sustainable development and climate resilient pathways to focus the Box 5.3.7 on Tropical Cyclone Pam as there is enough documentation, both peer-reviewed literature and grey there to gather lessons learned from this event and what these mean for development, adaptation and DRR when one single storm wipes out years of development outcomes in a day. The number of people reached by the NGO initiative again is not necessarily a robust measure because the program's success is varied in traditional governance arrangements where gender inequality still plays a big role in who benefits from programs and aid. Many remote communities have also more pressing needs than climate awareness education and equally there are many other initiatives in Vanuatu that support communities, and perhaps this box should be a broader reflection on the country level rather than focused on one program. [Johanna Nalau, Australia]</td>
<td>Thank you for this detailed comment. We agree and while the FOD focused on a local NGO partnership the SQD has been expanded to include the state level planning by Vanuatu as a republic and its leading role in integrating planning. The references are now included. The impact of Cyclone Pam on pathways is noted however space constraints and the focus of this report prevent following cyclone responses this can be expanded in WRI. The issues of gender inclusiveness and diverse needs and demands of regional communities is noted in 5.3 and 5.3.2.</td>
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<td>14309</td>
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<td>8</td>
<td>What are the percentages here? I don't understand how 'risk indices' work. [Jason Donev, Canada]</td>
<td>The percentages have been removed.</td>
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<td>28</td>
<td>There is a space after &quot;v&quot; redundent that should be deleted. [Kai Fang, China]</td>
<td>Copied citing to be completed prior to publication of the report.</td>
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<td>19312</td>
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<td></td>
<td>Tramel 2016 is not in reference list. [Doreen Stabinsky, United States of America]</td>
<td>Now included.</td>
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<td>6470</td>
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<td>It is better to use Climate Resilient Development Pathways instead of CRDP in title of Box 5.4 like the title of subsection 5.7.A [Mikiko Kamezu, Japan]</td>
<td>Yes - correct.</td>
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<td>10687</td>
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<td>See social innovation (Brink et al. 2017) and review culturally appropriate opportunities for fostering resilience to climate and other disturbances (Smit and Verbeke 2016). Culturally appropriate development pathways help to create and maintain the necessary reservoirs of social and ecological diversity and thus support the development of mixed-adaptation pathways beyond more narrowly defined systems and institutional rigidity (Smit and Verbeke 2016) – References: Smit, B. &amp; Verbeke, W. (2016) Resilience in the rural Andes Critical dynamics, constraints and emerging opportunities. Regional Environmental Change 16:8, 2163-2170 [Diana Sietz, Netherlands]</td>
<td>Thanks for the reference - it is in the last row.</td>
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<td>The format of the &quot;in this line is different from the above. [Kai Fang, China]</td>
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<td>This part should be rephrased; especially the terms in &quot;...&quot; The way it is reads very subjective, even if the words are in &quot;...&quot; [Johanna Nalau, United Kingdom (of Great Britain and Northern Ireland)]</td>
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<td>Please get rid of ( ) and for the citation [TYMON ZIELICKI, Poland]</td>
<td>Done.</td>
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<td>This is more a typo to each in subsection in Section 5.7.4 on challenges and limitations of climate-resilient development pathways. There is some discussion of various challenges throughout the other sections but no focused discussion as well as no consideration of limitations to such pathways. Even with climate-resilient development pathways, there will be unequal impacts of climate change and some such pathways will not prevent loss and damage from taking place. [Cari-Friedrich Schleussner, Germany]</td>
<td>The last section of 5.3 addresses some of the challenges and limitations. We will have more evidence from emerging literature for the final government draft.</td>
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<td>18757</td>
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<td>43</td>
<td>40</td>
<td>Types: Bios 5.2.6 and 5.2.4 [William Moultzuma Okis, France]</td>
<td>Type has been corrected.</td>
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Comment No | From Page | From Line | To Page | To Line | Comment | Response
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12687 | 43 | 40 | 43 | 51 | Yes, this is good. However, there is a sense here that the world is in agreement that we need to transform development pathways. Yes in what the point was raised in the other direction, where inequalities are pronounced, and, not people? The idea that we need to transform development and “our societies” (line 49) might be shared - but that the direction of transformation is still not shared around the world. [Lisa Schipper, Vietnam] | Thank you. We now state that there is no consensus on the direction of transformation.
12686 | 43 | 42 | 43 | 42 | What does the intrinsic challenge of scoring on all fronts mean? [Lisa Schipper, Vietnam] | The wording has been adjusted to clarify the meaning of the phrase. The wording has been adjusted to clarify the meaning of the phrase.
9730 | 43 | 45 | 43 | 45 | The “3” should be changed into “3”. [Ken Fang, China] | The change has been made.
14151 | 43 | 45 | 43 | 45 | Wrong numbering [JST Environ Policy and Governance, Germany] | The numbering has been corrected.
19852 | 43 | 49 | 43 | 51 | 19 | With regard to the statement in the rest of the literature on how to transform development while addressing change climate - I would argue that this literature (academic and grey) is expanding and is found across a wide range of disciplines. See the literature referenced throughout this review. See also the work of organizations like the Mary Robinson Foundation that work specifically on this point. [Tara Shine, Ireland] | We will include it in the final draft: Thank you.
12717 | 44 | 1 | 44 | 13 | Somewhere in this sub-section, Morton in H. Human (ed) Making Climate-Compatible Development Happen, Routledge, could be cited (on social and iterative learning in extension and research support to agricultural adaptation). [John Morton, United Kingdom of Great Britain and Northern Ireland] | This section has been further developed. More to come for the final draft in May.
6599 | 44 | 1 | 44 | 13 | The section on social learning seems to be a bit underdeveloped, especially as the whole new “mindset” or paradigm shift from the failure of Copenhagen based on “top-down and command and control” approaches is now replaced by a voluntary, distributed social and (sustainability) learning approach based on experimentation, and scaling up, deep and forward (among others). Please also notice that social learning can and need also to be monitored and evaluated, especially with regard to what extent social learning has managed to: 1. Recycle subversive frameworks and perceptions; 2. Mobilize and trigger multiple interests as to support collective action; 3. Provide the necessary resources and conditions; and 4. Build new institutions able to redistribute responsibilities at different levels of governance and individual action. (Source: Tabares, J. D., Xiu, J., Ji, G., McEnery, O., Neuhäfli, H., Serna, A., Werner, S., and Wiel, J. J. 2015: The Climate Learning Lab: A pragmatic procedure to support climate adaptation, Environmental Policy and Governance, 25:1-11. doi: 10.1002/esp.2016 [J. David Tabara, Spain]) | This section has been further developed. More to come for the final draft in May.
9390 | 44 | 3 | 44 | 3 | Figure 1.8 in Chapter 1 had presented the “Schematic storyline figure for the rest of the report”. Based on the framework set by Figure 1.8, Chapter 5 on “Policy Options and SDS” may be strengthened in the aspect of the response options. Additional information from the “Beyond 2 degrees Scenario – B2DS” of the Energy Technology Perspectives 2017 (ETP 2017), the emphasis on cities in “Energy Technology Perspectives 2018: Towards Sustainable Urban Energy Systems,” as well as “Renewable Energy Sources and Climate Change Mitigation Special Report of the Intergovernmental Panel on Climate Change” may be represented in Chapter 5. [Sis KLUSK, Turkey] | Chapter 1 text has been modified and hence this comment is no longer valid.
2088 | 44 | 8 | 44 | 13 | Reverse citation please [TYMON ZELIŃSKI, Poland] | The order of the citation has been corrected.
19853 | 44 | 16 | 44 | 28 | Human rights could be further emphasized as the fundamental tools for the achievement of equity and justice. Emphasize the need to respect rights in all climate actions. [Tara Shine, Ireland] | This section is explicitly about rights and human rights, but doesn’t explicitly say ‘human’.
2089 | 44 | 18 | 44 | 19 | Reverse citation please [TYMON ZELIŃSKI, Poland] | The order of the citation has been corrected.
18758 | 44 | 22 | 44 | 22 | Typo: Biocas 5.0 6.4 9.5 9.2-9.4 (William Mulvihull Clean, France) | The typo has been corrected.
3703 | 44 | 22 | 44 | 26 | Good point - consider adding the question of who (which actors) determine the meaning of transformational change - see Winter, H & Dubash, H. 2016. Who determines transformational change in development and climate policy? Climate Policy 16 (6): 783-791. DOI: 10.1080/14693062.2015.1033674 [Harald Winkler, South Africa] | The author agrees with this point, has reviewed the reference and has added the question of which actors determine the meaning of transformational change to the text.
2990 | 44 | 24 | 44 | 28 | Reverse citation please [TYMON ZELIŃSKI, Poland] | The order of the citation has been corrected.
20681 | 44 | 31 | 44 | 31 | Besides Figure 7.1, useful to add the importance of qualitative indicators for M&E. It was something missing for MDGs (indicators focused more on the amount of money spent or the number of beneficiaries and not so much on how well an action was done or if results were still good a good number of years after). [Debora Ley, Guatemala] | This is an important point which has been added to the text. Additional references were required.
20682 | 44 | 31 | 44 | 31 | This should also include mitigation, as there are cases where projects don’t reduce as many emissions as expected initially, or stop having co-benefits (or increases them), therefore M&E should go across. [Debora Ley, Guatemala] | The notion of climate-resistant development pathways includes both adaptation and mitigation, therefore it is implicit that indicators for CRDPs would do so. The text in section already includes mention of indicators for mitigation (e.g. ‘location saved through low carbon Westpaw’).
20683 | 44 | 31 | 44 | 31 | It would be good to include impact evaluation here as we are talking of long-term scenarios and the need to ensure results long-term (or be able to change direction midway if needed) [Debora Ley, Guatemala] | This is an important point which has been added to the text.
2891 | 44 | 44 | 44 | 44 | Reverse citation please [TYMON ZELIŃSKI, Poland] | The citation is already in the correct order.
10058 | 44 | 50 | 44 | 54 | Reverse citation please [TYMON ZELIŃSKI, Poland] | This is a valuable point, which has been included after consultation of the supplied reference.
12688 | 45 | 1 | 45 | 10 | In order to do the right kind of climate resilient pathways in the context of mitigation options that reduce greenhouse gas emissions, whereas for adaptation it is about dealing with the impacts of 1.5 warming. To what extent is this chapter able to reconcile these two different ways - how would they fit into one of the pathways figures, for example? [Lisa Schipper, Vietnam] | This chapter does not provide the evidence to support the statement that moving toward 1.5 is possible. [Lisa Schipper, Vietnam]
13689 | 45 | 12 | 45 | 12 | True. We have reformulated in terms of the enabling conditions to reach the climate objective and sustainable development | True. We have reformulated in terms of the enabling conditions to reach the climate objective and sustainable development.
17078 | 45 | 24 | 45 | 40 | Differences in knowledge and understanding on the topics between the high- and low-latitude or developed and developing countries should also raise as a challenge as it may hinder the implementation of climate change actions as defined in SDG 13 [Penfam Perdindem, Indonesia] | Noted. This information is better suited for Chapter 4, which discusses the implementation challenge.
<table>
<thead>
<tr>
<th>Comment No</th>
<th>From Page</th>
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<th>To Page</th>
<th>To Line</th>
<th>Comment</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>12068</td>
<td>45</td>
<td>28</td>
<td>45</td>
<td>55</td>
<td>There are several other research gaps worth mentioning in this section. For example, it is unclear when adaptation limits are reached and where (e.g., some places have already met their adaptation limits) and research is needed to understand where such limits have already arisen, where these are likely to arise, and what that means planning for 1.5 degree world at community, national, regional and global level. The concept of adaptation limits is not brought in the chapter although it is highly relevant for SDG achievement. The chapter should also make a stronger contribution to the concept of Loss and Damage (which lies with adaptation limits) in a 1.5 degree world. L&amp;D has certainly occurred at much more broader scales than currently. What does that mean for climate resilient pathways? There should also be more focus on massive extreme events, such as category 5 cyclones and multiple simultaneous cycles/hurricanes, and what these challenges pose for sustainable development and life overall in particular communities. This discussion can be tied to ethics and justice in terms of who bears responsibility but also who has the right to determine a development/adaptation pathway especially if more transformative actions are needed already now state quo is maintained. [Johanna Natau, Australia]</td>
<td>Adaptation limits are covered in Chapters 3 and 4, as well as too. We include here a research gap linked to a global approach to adaptation which fails to capture the limits affecting sustainable development</td>
</tr>
<tr>
<td>19854</td>
<td>45</td>
<td>28</td>
<td>45</td>
<td>33</td>
<td>More evidence also needed of the effects of 1.5 on human rights. Equally important are the differentiated impacts on women. [Tara Shine, Ireland]</td>
<td>These aspects have been considered when reassessing the research gaps</td>
</tr>
<tr>
<td>14162</td>
<td>45</td>
<td>32</td>
<td>45</td>
<td>32</td>
<td>How do you know the level of knowledge on the topic is equal to that of previous topic? Perhaps better to avoid implying it has been quantified and delete equally? [Elvira Poloczanska, Germany]</td>
<td>The term equally is not meant to imply a precise comparison</td>
</tr>
<tr>
<td>19855</td>
<td>45</td>
<td>35</td>
<td>45</td>
<td>38</td>
<td>The differential impacts of 1.5 versus 2 or more also need to be understood in terms of human rights implications. [Tara Shine, Ireland]</td>
<td>These aspects have been considered when reassessing the research gaps</td>
</tr>
<tr>
<td>1133</td>
<td>45</td>
<td>37</td>
<td>45</td>
<td>38</td>
<td>This bullet point is an unfortunate example of a tendency, that surfaces occasionally in the chapter, to abstract writing bordering on jargon. [John Morton, United Kingdom (of Great Britain and Northern Ireland)]</td>
<td>It appears as jargon to some while others consider it a powerful statement. We decided to keep it.</td>
</tr>
<tr>
<td>4798</td>
<td>45</td>
<td>44</td>
<td>45</td>
<td>46</td>
<td>- If also calls for taking understandable resistance, damages and costs, and the need for compensation into account [Marcel Wissembourg, Netherlands]</td>
<td>We need to take into account resistance and differential costs is discussed as case enabling conditions in section 5.6. This sentence calls for more in-depth analysis. And compensations are one type of policy interventions, but we do not want to highlight one single instrument</td>
</tr>
<tr>
<td>19856</td>
<td>45</td>
<td>44</td>
<td>45</td>
<td>48</td>
<td>This is a powerful statement and suggests an opportunity for greater consideration of the barriers to and enablers of effective adaptation that furthers climate resilient development. After all, recent UN documents in this regard (<a href="http://www.un.org">http://www.un.org</a>) have also focused on this, and many recent analyses of this horizon have appeared in the literature (e.g., see <a href="http://www.ucr.ac.za">http://www.ucr.ac.za</a>)</td>
<td>Thank you</td>
</tr>
<tr>
<td>10281</td>
<td>45</td>
<td>49</td>
<td>45</td>
<td>55</td>
<td>What is missing in this conclusion is a paragraph of the emerging methodologies for measuring the sustainability in relation to 1.5 C target. Completeness and heterogeneity of the data require a pragmatic approach (a mixed method) using qualitative and quantitative as well as geographical/visual methods. [Mihna Zminda, Hungary]</td>
<td>Bullet point added</td>
</tr>
<tr>
<td>19853</td>
<td>45</td>
<td>49</td>
<td>45</td>
<td>55</td>
<td>The bullet point reinforces the need for the inclusion of local communities and grassroots women and men and young people in determining socially desirable pathways through their active participation in decision making and research. The indicators should include human rights. [Tara Shine, Ireland]</td>
<td>Bullet point reformulated</td>
</tr>
<tr>
<td>14163</td>
<td>45</td>
<td>52</td>
<td>45</td>
<td>52</td>
<td>And the difference between what is ‘socially desirable’ and what is ‘socially acceptable’ [Elvira Poloczanska, Germany]</td>
<td>Socially desirable is used as a more general statement and “socially acceptable” only when highlighting the role of acoustic values, internet contestations, and political dynamics</td>
</tr>
<tr>
<td>5081</td>
<td>46</td>
<td>3</td>
<td>46</td>
<td>3</td>
<td>I would suggest including the gap of case studies in the various countries relating land grabbing and green grabbing and the possibilities of CRDPs. [CRISTIAN DESCONIS, Brazil]</td>
<td>We do not highlight one specific type of case study, but rather point more generally to the need for more case studies. We stress the importance to take into account the specificities if each context</td>
</tr>
<tr>
<td>5082</td>
<td>46</td>
<td>3</td>
<td>46</td>
<td>3</td>
<td>I suggest including the gap of the experiences of CRDPs of local agents - communities, social movements, peasants, urban groups and their possibilities of action by national state policies. [CRISTIAN DESCONIS, Brazil]</td>
<td>Noted. We point to the need for diverse case studies. And we also include a specific bullet point on the question of articulation of scales (i.e. deriving lessons for global/national scale from local experiences)</td>
</tr>
<tr>
<td>12690</td>
<td>47</td>
<td>2</td>
<td>47</td>
<td>47</td>
<td>The FAQs are a good start but very challenging to answer, and at the moment I am not sure if this chapter can offer succinct responses that also provide real information to decision-makers. [Lex Schipper, Vietnam]</td>
<td>The FAQs have been removed</td>
</tr>
<tr>
<td>7014</td>
<td>47</td>
<td>13</td>
<td>47</td>
<td>13</td>
<td>Overlapped with CRDP’s are one particular note for comment. In fact, the whole chapter as it stands looks rather bulky and overloaded with a listing of references that take up nearly half the spaces. It may be more readable and appeal more to the readers if the chapter can be structured around the four or more) Q&amp;A’s [Li Ming Lee, China]</td>
<td>The FAQs have now in all SDG chapters.</td>
</tr>
<tr>
<td>14310</td>
<td>47</td>
<td>1</td>
<td>47</td>
<td>12</td>
<td>The FAQs appear only in the chapter, was that on purpose? [Jason Stone, Canada]</td>
<td>The FAQs provide an opportunity to convey key messages in an accessible way. The references are the needed evidence to reach confidence statements in the chapter</td>
</tr>
<tr>
<td>6467</td>
<td>47</td>
<td>2</td>
<td>47</td>
<td>12</td>
<td>FAQs point out important topics. Executive summary could consist of descriptions answering these questions [mikiko Kainuma, Japan]</td>
<td>The FAQs highlight important messages from the chapter, expressed in most accessible ways and without confidence statements.</td>
</tr>
<tr>
<td>10539</td>
<td>47</td>
<td>3</td>
<td>47</td>
<td>12</td>
<td>I don’t understand why there are FAQs in the end of the chapter. [Linda Yard Subakoes, Indonesia]</td>
<td>In the SDG’s, all chapters have FAQs at the end</td>
</tr>
<tr>
<td>6468</td>
<td>47</td>
<td>9</td>
<td>47</td>
<td>9</td>
<td>1.5 C policies could increase the gap between the rich and the poor (e.g., see p-12 lines 8-7) Please discuss such negative impacts in FAQ5-3. [Tara Shine, Ireland]</td>
<td>The FAQs highlight important messages from the chapter, expressed in most accessible ways and without confidence statements.</td>
</tr>
<tr>
<td>1897</td>
<td>47</td>
<td>11</td>
<td>47</td>
<td>12</td>
<td>The term equally is not meant to imply a precise comparison</td>
<td>We have decided to reformulate the analysis of the chapter around the discussions of enabling conditions to make the sustainable development and 1.5C transformation possible. This is reflected in a reformulation of the sentence in the ES, and a reorganization of the discussion in the FAQs</td>
</tr>
<tr>
<td>6600</td>
<td>47</td>
<td>11</td>
<td>47</td>
<td>12</td>
<td>Seems an additional FAQ is missing here: Is it possible to simultaneously achieve sustainable development (incl. the SDGs) and overheat the 1.5 C target? [At present no temporal or intergenerational issues were not addressed adequately in the report, e.g, for how many generations? [J. David Falcon, Spain]</td>
<td>Overshoot is discussed in the chapter, but we decided not to have it as a specific FAQ</td>
</tr>
<tr>
<td>Comment No</td>
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<td>Comment</td>
<td>Response</td>
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<tr>
<td>18839</td>
<td>48</td>
<td>1</td>
<td>58</td>
<td>9</td>
<td>There are too many references and most of them are not cited in the text. [Hong Yang, Belarus]</td>
<td>Many of the references pertain to table 5.1.</td>
</tr>
<tr>
<td>3748</td>
<td>48</td>
<td>1</td>
<td>59</td>
<td>9</td>
<td>There is no reference to a webpage or a document that is being referred to. [Kai Fang, China]</td>
<td>Noted. It is noted that this reference cannot be found.</td>
</tr>
<tr>
<td>4220</td>
<td>48</td>
<td>19</td>
<td>47</td>
<td>47</td>
<td>A report has been entered as a reference database. [Jessica Callen, Austria]</td>
<td>Comment not clear.</td>
</tr>
<tr>
<td>18761</td>
<td>49</td>
<td>16</td>
<td>49</td>
<td>16</td>
<td>The reference for the website does not appear to be a worldwide website. [Jessica Callen, Austria]</td>
<td>Updated in the reference database</td>
</tr>
<tr>
<td>18762</td>
<td>49</td>
<td>44</td>
<td>49</td>
<td>44</td>
<td>The website needs to be updated. [William Moufouma Okia, France]</td>
<td>Noted. Updated in the reference database.</td>
</tr>
<tr>
<td>4219</td>
<td>53</td>
<td>29</td>
<td>53</td>
<td>30</td>
<td>The reference is not correct. [Jessica Callen, Austria]</td>
<td>Noted. It is not the scope of this report to update the analysis of nuclear power per se. We refer to the IPCC AR5 WG3 Chapter 7 for a detailed assessment.</td>
</tr>
<tr>
<td>804</td>
<td>59</td>
<td>58</td>
<td>58</td>
<td>58</td>
<td>The reference is not correct. [Jessica Callen, Austria]</td>
<td>Noted. It is not the scope of this report to update the analysis of nuclear power per se. We refer to the IPCC AR5 WG3 Chapter 7 for a detailed assessment.</td>
</tr>
<tr>
<td>1978</td>
<td>62</td>
<td>1</td>
<td>85</td>
<td>10</td>
<td>Reference is not correct. [Jessica Callen, Austria]</td>
<td>Noted. It is not the scope of this report to update the analysis of nuclear power per se. We refer to the IPCC AR5 WG3 Chapter 7 for a detailed assessment.</td>
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<tr>
<td>18764</td>
<td>62</td>
<td>40</td>
<td>62</td>
<td>40</td>
<td>Reference is not correct. [Jessica Callen, Austria]</td>
<td>Noted. It is not the scope of this report to update the analysis of nuclear power per se. We refer to the IPCC AR5 WG3 Chapter 7 for a detailed assessment.</td>
</tr>
<tr>
<td>4210</td>
<td>62</td>
<td>51</td>
<td>62</td>
<td>53</td>
<td>Reference is not correct. [Jessica Callen, Austria]</td>
<td>Noted. It is not the scope of this report to update the analysis of nuclear power per se. We refer to the IPCC AR5 WG3 Chapter 7 for a detailed assessment.</td>
</tr>
<tr>
<td>5732</td>
<td>63</td>
<td>34</td>
<td>63</td>
<td>34</td>
<td>The format of the text is different from the others. [Kai Fang, China]</td>
<td>Corrected in the reference database.</td>
</tr>
<tr>
<td>5733</td>
<td>64</td>
<td>2</td>
<td>64</td>
<td>2</td>
<td>Reference is not correct. [Kai Fang, China]</td>
<td>Corrected in the reference database.</td>
</tr>
<tr>
<td>4211</td>
<td>65</td>
<td>35</td>
<td>65</td>
<td>36</td>
<td>Reference is not correct. [Jessica Callen, Austria]</td>
<td>Noted. It is not the scope of this report to update the analysis of nuclear power per se. We refer to the IPCC AR5 WG3 Chapter 7 for a detailed assessment.</td>
</tr>
<tr>
<td>18766</td>
<td>67</td>
<td>47</td>
<td>67</td>
<td>47</td>
<td>Reference is not correct. [Jessica Callen, Austria]</td>
<td>Reference details are correct.</td>
</tr>
<tr>
<td>18767</td>
<td>74</td>
<td>3</td>
<td>74</td>
<td>3</td>
<td>Reference is not correct. [Jessica Callen, Austria]</td>
<td>Corrected in the reference database.</td>
</tr>
<tr>
<td>18768</td>
<td>74</td>
<td>59</td>
<td>74</td>
<td>59</td>
<td>Reference is not correct. [Jessica Callen, Austria]</td>
<td>Corrected in the reference database.</td>
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<tr>
<td>4212</td>
<td>77</td>
<td>53</td>
<td>77</td>
<td>55</td>
<td>Reference is not correct. [Jessica Callen, Austria]</td>
<td>Noted. It is not the scope of this report to update the analysis of nuclear power per se. We refer to the IPCC AR5 WG3 Chapter 7 for a detailed assessment.</td>
</tr>
</tbody>
</table>
Comment No | From Page | From Line | To Page | To Line | Comment | Response
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4217 | 81 | 20 | 81 | 21 | Reference (Tirmarche et al. 2012) This reference notes that... | Noted. It is not the scope of this report to update the analysis of nuclear power per se. We refer to the IPCC AR5 WGI Chapter 7 for a detailed assessment. However, we have added many additional references and evidence to provide a more comprehensive assessment of synergies and trade-offs across all SDGs and mitigation options.
19771 | 81 | 55 | 81 | 55 | This chapter needs to better reflect human rights and gender equality and their role in delivering equity, justice and fairness for all. | Taken into account. Greater emphasis on equity and rights- see in particular section 5.7.3.
6495 | 86 | 90 | 6495 | 90 | The size of fonts in Table 5.1 is too small to read. It is recommended to pick up several important impacts of mitigation options and to prepare a web-version of Table 5.1 with bigger fonts. [mikiko Kainuma, Japan] | Accepted. Table is in the appendix and a figure summarises the table in SOD.
3704 | 86 | 1 | 3704 | 1 | Comment on Table 5.1: Very much like the concepts in the table, and appreciate it captures a large amount of information in a dense form. The Tarkan score is particularly interesting: I assume empty cells will be completed - or else state explicitly that you point to gaps knowledge. However, the table is very hard to read, and likely impossible to print with any reasonable font and size. You might consider a) breaking up into parts; b) electronic means to "zoom in"; and c) other creative ideas [Harald Winkler, South Africa] | Noted. Article 5 is an instrument so no inclusion in mitigation option category but included in text boxes and chapter text.
7533 | 86 | 1 | 7533 | 1 | Table 5.1. We very much appreciate this Table. Please specify in parentheses with a clear reference to the corresponding SDG targets for all the 168 sustainable development dimensions that are assessed in the Table. It is currently only done on some. [Johvan Christophersen, Norway] | Accepted. Table is in the appendix and a figure summarises the table in SOD.
5747 | 81 | 90 | 5747 | 90 | The text in the tables is too small and not visible. [Hong Yang, South Korea] | Noted. We have distinguished in Table 5.1 between bio-energy and fossil CCS, and we have included the given reference in the evidence base.
4895 | 86 | 2 | 4895 | 2 | Table for SOD: Affordable and clean energy and the industrial CCS/CCU and Deployment of CCS in the power sector. Show the access to clean energy with CCS in the table (Wittfuhs-Maes, Netherlands) | Accepted. The table is in the appendix and a figure summarises the table in SOD.
4890 | 86 | 2 | 4890 | 2 | Table 5.1 Fors ODG (9) The country’s current energy use per capita in the year 2015 and in 2050, and the estimated energy mix by 2050. | Accepted. We have added in Figure 5.1 and the table that all energy supply options have positive impact by definition with SDG 7.
5108 | 87 | 1 | 5108 | 1 | This text is in too small and not visible. [Hong Yang, South Korea] | Noted. We have added in Figure 5.1 and the table that all energy supply options have positive impact by definition with SDG 7.
1225 | 87 | 2 | 1225 | 2 | Table 5.1 a is highly unsubstantiated regarding what is highlighted for the various mitigation options. Compare for example the nuclear and renewable options. Your literature searches must have bi literature searches must include relevant literature searches must include relevant literature. | Noted. We have made every effort to be balanced in the assessment, and there are numerous references to potential adverse impacts and trade-offs with regard to renewable energy sources. We have also included additional evidence on nuclear as a mitigation option.
18770 | 87 | 5 | 18770 | 5 | Reference has been inserted in Mendeley a book but looks like a webpage [William Mouamba Oka, France] | The comment page and line numbers do not correspond to a specific reference. All references will be checked for accuracy to the SDG.
6097 | 88 | 88 | 6097 | 88 | Table 5.1b SOD Agreed on CCS on fossil energy, but BECCS does not lock-in capital in fossil resources [Tirzad-David Canessa] | Noted. The updated structure of Table 5.1 now distinguishes between fixed CCS vs. BECCS and only attributes the negative lock-in impacts to fixed CCS.
6095 | 88 | 88 | 6095 | 88 | Table 5.1b. SOD: CCS in the power sector enables access to affordable and clean energy. There are also many examples of international cooperation in R&D, including between developed and developing countries such as Indonesia, South Africa and Mexico. The IEAGHG R&D Programme is one such example of a collection of cooperation R&D activities, ref: http://www.ieaghg.org] [Tirzad-David Canessa] | Agreed in principle. However, we did not find any scientific analyses that directly touches upon the issue.
Comment No | From Page | From Line | To Page | To Line | Comment | Response
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6096 | 88 | 5245 | 5251 | Column 4, row 15 | 5.1b. SDG9. CCS enables sustainable industrialization for those industries with no low carbon options such as iron and steel, cement and some chemical production. See Leeson et al. “A techno-economic analysis and systematic review of chemical CCS applied to iron and steel, cement, oil refining and pulp and paper industries” International Journal of Greenhouse Gas Control 61 (2017) 71-84. IEAGHG 2013/34 “Iron and Steel CCS Study” (July 2013).
 | Noted. We have included CCECCO as a mitigation option for the iron and steel sector; however, the evidence concerning the impacts on SDGs is limited.

4215 | 89 | 5275 | 5278 | Column 4, row 10 | 5.1c. Ocean acidification is a very significant impact. The only technology with the potential to reduce CO2 emissions at an acceptable and affordable pace is BECCS and DAC. Storage of CO2 in CCS is already being used on a commercial scale at several power plants in the US and Canada. The use of CO2 for enhanced oil recovery (EOR) has been used for decades to boost oil recovery from oil fields.
 | Noted. We modified the text on CCS in Table 5.1c as follows: "CO2E is used as a reference with regard to the concerns for ocean acidification. This is not necessarily true as the technology is not yet fully developed."

6094 | 89 | 5279 | 5283 | Column 4, row 4 | 5.1b. Ocean acidification is a very significant impact. The only technology with the potential to reduce CO2 emissions at an acceptable and affordable pace is BECCS and DAC. Storage of CO2 in CCS is already being used on a commercial scale at several power plants in the US and Canada. The use of CO2 for enhanced oil recovery (EOR) has been used for decades to boost oil recovery from oil fields.
 | Rejected. It is beyond the scope of the SR1.5 to re-assess the analysis going into the AR5, which collected evidence and expertise across all aspects of the energy system in a process as comprehensive and balanced as possible (see in relation to your comment). It is beyond doubt that long-term storage of ocean acidification and uranium mining pose risks. If not causing outright damage, to the environment and the terrestrial ecosystem.

4216 | 90 | 5284 | 5286 | Column 4, row 4 | 5.1c. Ocean acidification is a very significant impact. The only technology with the potential to reduce CO2 emissions at an acceptable and affordable pace is BECCS and DAC. Storage of CO2 in CCS is already being used on a commercial scale at several power plants in the US and Canada. The use of CO2 for enhanced oil recovery (EOR) has been used for decades to boost oil recovery from oil fields.
 | Rejected. It is beyond the scope of the SR1.5 to re-assess the analysis going into the AR5, which collected evidence and expertise across all aspects of the energy system in a process as comprehensive and balanced as possible (see in relation to your comment). It is beyond doubt that long-term storage of ocean acidification and uranium mining pose risks. If not causing outright damage, to the environment and the terrestrial ecosystem.

7217 | 92 | 5316 | 5320 | Cities are an equivalent, and possibly more credible, emerging green force in the Global South.
 | Yes. Cities are covered as a driver of sustainability transitions/transformations in cross-chapter box 5.1: "Cities and Urban Transformation". Specific reference to cities in the Global South has been included.

7218 | 36 | 5321 | 5324 | Would question South Africa as an emerging green power, especially the reference of support from trade unions in the text box. Last month the major wage union COSATU staged a white-glove renewable energy support of coal-fired plants, as is expected and risks a cut of data and wrong. IEPPPP is acclaimed for its design and initial implementation, but after much was blocked by a government worried about its pinning networks to coal-fired and coal-based electricity production. Good policies but very high CO2 capture costs for SDP, not socially inclusive - resource efficient and a government vested in CO2 intensive extractive industries. Some of the RE and off-grid activities in East Africa might provide a better example.
 | The case study on South Africa has been removed.

15653 | 43225 | 48 | 43225 | 48 | Unrelated word competition [Malaysia Homegrow, Germany]
 | [Graff.]
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<thead>
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<th>Comment No</th>
<th>From Page</th>
<th>From Line</th>
<th>To Page</th>
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<th>Response</th>
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<td>15654</td>
<td>44317</td>
<td>23</td>
<td>44317</td>
<td>29</td>
<td>This paragraph is in our view highly misrepresented research on the CDM as well as its actual implementation on the ground as experienced by millions of people and needs to be fundamentally revised: First off, the CDM is the only mechanism that has resulted in billions of tons of consistently measured, reported and verified emissions reductions and as such has significantly contributed to SDG 13. Secondly, judgment on sustainable development contributions has been viewed to contribute to the sustainable development of its host country, which otherwise would not have allowed it in the first place. Third, these countries that had been underrepresented due to insufficient capacity to access the CDM have increasingly gained access over the years, by gradual capacity development as well as thanks to the efforts of the CDM Executive Board and CDM participants to standardize and simplify procedures. Just when Africa was ready, the CDM fell into oblivion due to a lack of political willpower. If the CDM is continually vilified despite having resulted in massive investments in offgrid energy access and a net financial transfer from the global north to the global south, African nations once again will be left behind whereas the Paris Market Mechanism builds on the established infrastructure and know-how of African nations. Where the CDM has rightly been criticized, was in case of a very small percentage share of projects, many of which have as a consequence of such criticism no longer been financially benefitting from the CDM, as major buyers (e.g. the EU ETS) have stopped purchasing their CERs. There is no peer-reviewed publications on human rights violations of the CDM. [Matthias Honegger, Germany]</td>
<td>Noted. Text substantially revised with focus on mitigation options and SDG implications across various sectors. CDM is an instrument. Role of carbon price market and other policy instruments are included in the section 5.4</td>
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<td>The statement that &quot;almost all research studies conclude that sustainable development is overlooked in such projects in the interest of emissions reductions which generate market benefits for host countries and project developers&quot; is definitely false not only for its sweeping generality. The statement implies that economic sustainability is not a relevant sustainability dimension, which is quite frankly a severe affront towards developing countries, who more often than not place a great emphasis on this dimension of sustainability in numerous forms (job creation, economic growth or reduction in dependence on imported fossil fuels). This criticism can be traced back to the issue that there is no international standard approach by which to judge Sustainable Development Contributions according to internationally defined criteria. As such, it is not really a criticism of the CDM itself, but of a global system in which it is not only a political global elite that deftly norms over sustainable development for the entire globe. This latter point illustrates that such sharp and one-sided criticism of the CDM regarding sustainable development is entirely misplaced here. [Matthias Honegger, Germany]</td>
<td>Noted. Text substantially revised with focus on mitigation options and SDG implications across various sectors. CDM is an instrument. Role of carbon price market and other policy instruments are included in the section 5.4</td>
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<td>15656</td>
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<td>44317</td>
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<td>The final statement on renewables being underrepresented is an outright falsehood. The UNEP CDM project pipeline lists the following project types among the five most frequent types: Wind, Hydro, Biomass Energy and Solar; together these categories cover 71.2% of all CDM projects. Like I wrote above, this paragraph is in dire need of substantiation and revision! [Matthias Honegger, Germany]</td>
<td>Noted. Text substantially revised with focus on mitigation options and SDG implications across various sectors. CDM is an instrument. Role of carbon price market and other policy instruments are included in the section 5.4</td>
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