

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
1	56971	12	0	0	0	0	There is some literature you include that, according to my information, does not fulfill the peer-review criteria in the same way as journal articles do. This includes, for instance, the book of Webersik (2010) and the edited volume of Peluso/Watts (2001) (there are some others but I am not so sure about those). (Tobias Ide, Research Group Climate Change and Security)	These sources are books and are within the IPCC criteria for peer-reviewed literature. The IPCC General Guidance on the Use of Literature in IPCC Reports considers non-peer reviewed literature to be "industry journals, internal organisational publications, nonpeer reviewed reports or working papers of research institutions, proceedings of workshops". No changes have been made in response to this comment.
2	58688	12	0	0	0	0	After the criticism by people like Gleditsch that the broader social and political implications of climate change were neglected in the last report, it's highly welcome that the IPCC now dedicates ample space to them (notably Chapters 12 and 13, as well as various sections in Chapters 18 and 19). Human security is as good as any other umbrella term for this, and it's very much in line with the IPCC's mandate. But, obviously, the introduction of the broader social and political implications of climate change entails an enormous responsibility for you to get it right. The chapter needs to be based on the full spectrum of the available scholarly and peer reviewed literature, rather than reflecting the personal views of the lead and contributing authors. I'm afraid that, in some places, I have a lingering sense that you present your own "critical" views while not allocating enough space to the views criticized. For example, you devote ample space to literature critical of the notion of "climate refugees" while hardly devoting any space to those who have introduced that notion in the first place. While this is fairly common in social scientific circles, in the context of an IPCC report it is problematic because critics may then accuse you of being biased. (Joerg Friedrichs, University of Oxford)	No specific references that could be cited are offered in this comment, no description of the nature of the possible bias is offered. No changes have been made in response to this comment.
3	58689	12	0	0	0	0	While the previous Assessment Report could be criticized for having been written largely by natural scientists with little sensitivity for social scientific debates and concerns, the present chapter can perhaps be criticized for the reverse. There are only few linkages to specific scientific evidence or modelling projections about climate change (the remit of the Working Group I). Moreover, you follow the practice of many social scientists of reducing climate change to extreme weather events (and hazards) while devoting far less attention to climate change as a source of chronic stressors. An example for this is the section on migration where you discuss displacement by catastrophic events far more than slow-motion migration scenarios driven by continuous environmental change. (Joerg Friedrichs, University of Oxford)	We have added a figure, that is now standard across many chapters of the WGII report, that summarises key risks into the future. We have also added a summary paragraph at the end of each section that characterises future risks.
4	58690	12	0	0	0	0	While the usual criticism is that the IPCC is too "alarmist", you sometimes go to the other extreme. It's fair enough to state that available data from recent decades or centuries do not show a compelling link between, say, weather extremes and the outbreak of social violence. But it's also fair to bear in mind that the last couple of centuries have not witnessed the kind of climate change predicted for the next few generations. Therefore, it is dangerous to only extrapolate recent trends without considering the danger of discontinuities. For example, you state that various forms of international support have mitigated the effects of environmental crises. That's true, but international aid itself may suffer if climate change stresses affluent societies. It appears problematic to simply assume the continuation of globalization and industrial society. In other words, more "alarmist" views should get a fair hearing. (Joerg Friedrichs, University of Oxford)	We have added expert analysis in the new Risk Table, that is now standard across many chapters of the WGII report, that summarises key risks into the future as well as expert judgement on the prospects for adaptation. We have also added a summary paragraph at the end of each section that characterises future risks.
5	58978	12	0	0	0	0	(1) The whole chapter is built on a "climate change" that is not defined in its scope or intensity, and a link between climate change and "extreme weather events" (storms, floods, etc.) that is even less defined. This base seems much too weak to proceed to conclusions; (2) Even if the scientific base was sound and solid, to proceed to conclusions (adverse effects for "human security" of these changes) supposes value judgments, which should be formulated. (Drieu Godefridi, Cogito)	Climate change is defined in the glossary. The links between climate change and extremes are well explained in the IPCC SREX and the report from WGI. The conclusions we have reached are justified by a systematic assessment of the relevant literature, with lines of sight between the Executive Summary points and the relevant sections in the chapter that justify those points. No changes have been made in response to this comment.
6	59012	12	0	0	0	0	There is some discussion of water as a human security issue, but minimal reference to food security. Although there is an entire chapter focused on this issue, food security/human security could also be highlighted further in this chapter, with reference to the food security/health chapters. (Celia McMichael, La Trobe University)	Food security is considered in sections 12.2.1, 12.3.3, 12.5.2, 12.6, 12.7. There are regular references to chapter 7, which has a far more extensive discussion. No changes have been made in response to this comment.

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
7	61263	12	0	0	0	0	The chapter looks at the association between climate impacts and human security, however, it does not relate this to actual projections of climate change. This means it is a general exploration of how weather and climate relates to human security, not an assessment of what the consequences of the actual levels of change that scientific research is projecting will mean. Not suprisingly the conclusions drawn from thsi are unclear and vague. (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	We have added a figure that is now standard across many chapters of the WGII report, that summarises key risks into the future. We have also added a summary paragraph at the end of each section that characterises future risks.
8	61264	12	0	0	0	0	It is not possible for a policy maker to gather information for decision-making in response to the potential consequences of climate change from this chapter. (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	The IPCC is not intended to be policy prescriptive. No changes have been made in response to this comment.
9	61265	12	0	0	0	0	Climate-induced migration: impacts that the receiving communities and areas may themselves undergo are an aspect that is completely missing in this chapter. (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	This is discussed in Table 12.3. No changes have been made in response to this comment.
10	61266	12	0	0	0	0	We appreciate the inclusion of Inglehart & Norris, Chatterjee, Foresight, and a range of sources that comprise what this Chapter aims to be: "the first systematic assessment across the dimensions of human security". However, from the first sentence of the executive summary we notice a trend that runs throughout this chapter: namely, the primacy given to culture and identity. While cultural aspects are indeed important enough to warrant sufficient coverage, the primacy given to it here and overall might need reconsideration, particularly when weighed against the prospects of increasing disasters, violent conflicts, diseases, death tolls, access to essential resources for survival, and the increasing securitization of socio-economic sectors/rights... That said, we appreciate the note that cultural analyses increase the explanatory power of models of risk. (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	Section 12.3 on the cultural Dimensions of Human Security is one of seven principal sections of this chapter. The chapter includes discussion of livelihoods, migration, violent conflict and national security as well. Only two of the eight Executive summary points relate to issues of culture and identity. The assessment is balanced across a range of issues, no single issue has primacy. No changes have been made in response to this comment.
11	62266	12	0	0	0	0	The SOD version of the chapter on human security has significantly improved in quality and in the effort to include references from scholars from outside of the OECD world. However, there is an overemphasis on scholarship from a few OECD countries and the peer-reviewed scientific contributions of scholars from the global South and from BRIC countries are still not adequately represented. With a few exceptions only the scholarship published in English is assessed. This may not be representative of the global scholarship on cliamte cfhange and human security. The work of scholars from China, India, Russia and the Arab World is nearly totally lacking and from those countries that will be affected most by the implacts of climate change on human security. Among the authors (CLA, LA, CA) there were 7 from English speaking (3 from the UK, 2 from the USA, 2 from Australia, compared with 5 from the rest of the world ( 1 from Norway, Philippines, Mexico, South Africa and Colombia). This composition of the group of authors may explain that the scholarship from large parts of the world may not be sufficiently included in this chapter. (Hans Guenter Brauch, Free University of Berlin)	The assessment is based on a systematic review of the literature using carefully constructed searches using relevant key words, the literature we found using this method comprises the bulk of the literature we have assessed, in addition to key works recommended by reviewers, and other works we have found through reading the initial set of literature produced through our systematic search. With respect to the composition of the author team, this is a matter for the IPCC bureau, which they might like to consider for subsequent assessments. Nevertheless, the comments from reviewers through both rounds of reviews suggests that the chapter is a balanced assessment of the research.
12	62267	12	0	0	0	0	The chapter on " human security" has added section 12.6 on the "National Security Dimensions of Climate Change." However, it still ignores the rich policy debate and scientific discourse on the international security dimension of climate change, e.g. in the UN General Assembly, the UN Security Council, by regional arrangements under Chapter VIII of the UN Charter, by the European Council and Commissions and by many other global (World Bank, UNDP, UNEP, IOM) and of many regional organizations. Also the human security debate within the United Nations system, the two reports of its Secretary-General on Human Security of 2010 and 2012 and the peer-reviewed scientific literature that analysed these discourses are ignored. There is no single reference to international security (except for the citation of the journal International Security) in this chapter. (Hans Guenter Brauch, Free University of Berlin)	We discuss the geopolitical implications of climate change, which is clearly 'international' even if we do not use the word 'international'. We sought to balance national and international security dynamics in this section, and think the existing treatment meets this goal. We have considered the suggestion, but chosen not to make structural changes to the chapter.
13	62998	12	0	0	0	0	No further comment. I find the chapter well written, well referenced, and convincing overall. I look forward to its publication (Helen Ross, The University of Queensland)	Thank you.
14	65521	12	0	0	0	0	Chapter is very well written, but the word 'evidence' is overused. It is important not to use it without really showing evidence. The chapter also needs a more nuanced way when dealing with mobility, migration and displacement. The author(s) should be careful with using these terms and not placing them as synonyms. (Tamer Afifi, United Nations University Institute for Environment and Human Security)	We have provided a more nuanced and structured discussion of migration at the start of section 12.4. The suggestion about the use of the word evidence is noted, and we have systematically reviewed the text for the use of this word and adjusted the language accordingly.

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15	68228	12	0	0	0	0	In Chapter 12 of the report, it is stated that climate engineering contradicts the “1977 UN Convention on the Prohibition of Military and Any Other Hostile Use of Environmental Modification Techniques”. However the Convention underlines that it is not cover cases of peaceful activities. (RUSSIAN FEDERATION)	This text has been modified to reflect this concern - mention of the Convention deleted
16	68254	12	0	0	0	0	The ILO centers its attention to the repercussions of the impacts and adaptation to CC for social justice and the protection of vulnerable people. One of its strategies focuses on the Local Resource-Based approach for developing infrastructure. Infrastructure plays a major part in adaptation to climate change and rural infrastructure will be particularly badly hit. This approach integrates the combined use of local participation in planning with the use of locally available skills, technology, materials and appropriate work methdos. (Local investments for climate change adaptation: Green jobs through green works . A guide for identifying, designing and implementing interventions in support of climate change adaptation at local level, ILO Regional Office for Asia and the Pacific, 2011) See, pp 78-100 <a href="http://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/documents/publication/wcms_172716.pdf">http://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/documents/publication/wcms_172716.pdf</a> (Marek Harsdorff, ILO)	There is no specific suggestion associated with this comment. This is an issue that related to livelihoods, and is discussed in chapter 13. No changes have been made in response to this comment.
17	68256	12	0	0	0	0	For greater development on Rural Transport and Climate Change see Ob. cit. ILO Regional Office for Asia and Pacific Bangkok 2011, pp.200-2323 (Marek Harsdorff, ILO)	There is no specific suggestion associated with this comment. This is an issue that related to livelihoods, and is discussed in chapter 13. No changes have been made in response to this comment.
18	73399	12	0	0	0	0	As would be expected from this very strong chapter author team, this draft is thorough, thoughtful, and balanced. It covers an enormous amount of knowledge, which is a notable strength. In the process, however, it has become more of a summary of knowledge than an assessment of knowledge to determine major findings, which is to some degree a weakness. The challenge, of course, is that this is a new topic for IPCC, and bringing together the relevant knowledge is a necessary step; but the Executive Summary shows how difficult it is at this stage to extract a few coherent general findings. Within the chapter, the section on environmental migration is especially strong, benefiting from recent literatures such as the British Foresight report. The section on climate change and conflict is especially important, because this is probably the most salient human security issue for IPCCs governments. In this connection, the author team should compare their findings and references with the recent US NAS/NRC report on Climate and Social Stress (2013). There are other cases as well where the chapter, despite its long list of references, misses some significant contributions. Another example is the discussion of traditional sources of knowledge, which should consult and reference the book that developed from the Millennium Ecosystem Assessment: Bridging Scales and Knowledge Systems (Reid et al., eds., 2006). (UNITED STATES OF AMERICA)	We have consulted the US NAS/NRC report and cited it where appropriate. We have consulted the Reid et al (2006) volume, which was cited in the cross chapter case studies in the AR4 (C4.1.1), it adds no additional knowledge and so we have not added the citation.
19	73400	12	0	0	0	0	Chapter 12 was weak in making the link between climate change and human security, given the variables of human security promoted by the United Nations at the time of the 94 Human Development Report. Since that time the relationship between human security and state security has been accepted; primarily that, state security turns on maintaining its legitimacy in the eyes of the people (freedom from want), and that environmental change can place demands on the political system that must be met to prevent state failure. The summary below comes from, The Human Security Framework and National Human Development Reports, UNDP, 2006. The 1994 global HDR argued that the concept of security has "for too long been interpreted narrowly: as security of territory from external aggression, or as protection of national interests in foreign policy, or as global security from a nuclear holocaust. It has been related more to nation states than to people." "This narrow approach was categorically widened to include the safety of individuals and groups from such threats as hunger, disease and political instability; and protection from "sudden and hurtful disruptions in patterns of daily life." The report went on to further identify seven core elements that - when addressed together - reflect the basic needs of human security: economic security, food security, health security, environmental security, personal security, community security and political security. Suggest that the authors incorporate this definition, and this reference in the report. (UNITED STATES OF AMERICA)	The literature on human security has advanced since the 1994 UNDP report (which is cited in section 12.1). The association between human and national security is discussed in section 12.6. No changes have been made in response to this comment.

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
20	73401	12	0	0	0	0	Developing a topic new for the IPCC Report is challenging, especially when the topic does not have a single discipline or information base upon which to review and make an informed assessment and judgment of how, in this case, climate change can affect human security. The authors should be commended for their efforts in developing this Chapter. The Chapter is well organized and structured. The Executive Summary is concise, direct, and the writing style is clear and tells a cohesive story. The use of estimative language used with each take-home message is appropriate, and helps set the nature of the topic, and expectations for the reader on what to look for in detail later in the Chapter. The individual Sections of the Chapter would benefit from that same approach, and provide estimative language on the reporting itself, as well as on the assessment and judgment of the affect of climate change on human security. In general, each Section in the Chapter presents inconclusive findings on the affects of climate change on some aspect of human security. The Sections introduce how climate change may have the greatest affect on human security often through unintended indirect affects by crippling the very social institutions, infrastructure, or policies designed to ensure human security. However, the Sections lack estimative language on the confidence of the quality of data used to make such as assessment, and the likelihood that the assessment is accurate. This is likely a consequence of incomplete or at times fragmentary information that are not a fact, proof, or knowledge that definitively links the topics of climate change to some element of human security. In addition there seem to be instances where the Section is unable to assess the likelihood of climate change affecting human security because of data gaps where relevant information is nonexistent or fragmented. (UNITED STATES OF AMERICA)	Thank you, this is very helpful. We have added summary statements at the end of each substantive section in order to make each more conclusive.
21	73402	12	0	0	0	0	Each Section would benefit from estimative language on the confidence of the observations and the likelihood of the predicted outcomes of climate change on human security. The Chapter presents how well-understood historic conditions of vulnerability and adaptation can be used to predict future impacts of climate change on human security. However, the Chapter does not address the likelihood that over time and across regions, risk and vulnerability of human security to the impacts of climate change will change. Just as climate is not static, neither are cultures and institutions. It is possible, then, that those currently not vulnerable to the affects of climate change, and who can adapt and mitigate the impacts of climate change, today, may not be able to do so in the future, and likely face new challenges of vulnerability not presently considered. The past may not predict the future. For example, the Chapter addresses in great detail the challenges facing indigenous populations, but provides little balance in discussion to the relatively larger number comprising the remaining world's population's risk to climate change impacts. The assumption is that the past, well understood conditions of vulnerability will predict the future climate change impacts on human security. Is this a valid assumption? It may not be, and further highlights the need for targeted data collection to answer such questions to better inform policymakers. (UNITED STATES OF AMERICA)	We have added the Risk Table 12.4, that is now standard across many chapters of the WGII report, that summarises key risks into the future. We have also added a summary paragraph at the end of each section that characterises future risks.
22	73403	12	0	0	0	0	Health is conspicuously missing as an aspect of human security. While extensively discussed elsewhere, it needs to be woven into the broader discussion of human security, particularly as it bears on other issues, such as cost, livelihoods/income, state functioning, and capacity for adaptation. How might climate change induced changes in health (disease, injury, heat) interact with other factors such as extreme weather events, migration, increased urbanization? (UNITED STATES OF AMERICA)	There is a whole chapter on health (CH11), where these issues are extensively discussed. Given this, and in order to keep the chapter within page limits we have not added additional text on health.
23	73404	12	0	0	0	0	In a chapter that is pushing at the frontiers of currently available knowledge, it would be very helpful for it to end with a short section on priorities for improving knowledge in order to strengthen capacities to answer questions about climate change and human security. (UNITED STATES OF AMERICA)	We have added a discussion of data gaps and research needs into box 12.2

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24	73405	12	0	0	0	0	<p>Issues of power and political economy are given short shrift, though they are referenced, for example on pages 12 and 19. This is an area where there are few references in other parts of the AR5. The links to human security should be evident and this chapter should expound on them. Ch. 14.2 references a political economy approach to adaptation that looks at social vulnerability; Ethics and Political Economy are discussed fleetingly in 17.3.5; 20.2.1.2 brief reference to the political economy of climate change. Power and status are discussed briefly in other parts of the document, e.g. 13.1 and 13.2 in terms of differential ability to adapt or migrate (also 12). The particular issue of who benefits from (or perceives that they benefit from) the status quo is of particular importance, as change to the status quo will require addressing the perceptions of these actors and enlisting them in the broader process of change. The discussion of culture and human security is important, but perhaps too narrow in that it prejudices indigenous and traditional knowledge. These are important and should not be lost. The point that local/traditional forms of knowledge are important for broader human security is particularly salient. However, it would be helpful to add a discussion of broader/dominant cultural issues and how they impact on human security vis a vis climate change. For example, how mental models impact acceptance or denial of climate change and disconnects between expert vs. lay knowledge and opinion. See, for example, <a href="http://dx.doi.org/10.1016/j.gloenvcha.2006.05.001">http://dx.doi.org/10.1016/j.gloenvcha.2006.05.001</a>, <a href="http://link.springer.com/article/10.1023/B%3ACLIM.0000024781.48904.45#page-1">http://link.springer.com/article/10.1023/B%3ACLIM.0000024781.48904.45#page-1</a> Economic cost is largely absent from the discussion in Chapter 12, but there are several aspects of cost that are critically important and for which there is accumulating data, for example the cost of loss of ecosystem services (FAQ 4.4), the increasing cost of weather-related disaster, as in Chapter 5, costs of global adaptation (Ch 17), costs of extreme weather events (Chs 10 &amp; 18), reduced cost of using ecosystem adaptation in urban areas (Ch 8), 85% of the global cost of adaptation is in developing countries (Ch. 3 - this also links back to issues of political economy), the high cost of inaction (5.4.3, 5.5.3), increasing cost of food in Asia as a result of climate change (Ch. 24). All of these costs of course also relate to the ability of individuals, communities, and states to adapt and to manage climate-related threats. The consensus seems to be that cost of natural disasters is increasing, which seems largely due to expanding human infrastructure and development in areas prone to flooding or other weather-related (See this review of the cost of economic disasters: <a href="http://www.rff.org/RFF/Documents/RFF-DP-12-28.pdf">http://www.rff.org/RFF/Documents/RFF-DP-12-28.pdf</a> The article cites (Kahn, M.E. 2005. The Death Toll from Natural Disasters: The Role of Income, Geography, and Institutions. The Review of Economics and Statistics 87(2): 271-284) a correlation between income inequality and higher fatalities in natural disasters as well as a correlation between democracy and decreased fatalities. See also the International Disaster Database: <a href="http://www.emdat.be/natural-disasters-trends">http://www.emdat.be/natural-disasters-trends</a>) (UNITED STATES OF AMERICA)</p>	<p>With respect to political economy, we have discussed the issues raised in the literature we have assessed, and they are discussed, as noted in this comment, where appropriate. The chapter is implicitly about power - or its lack - since this is central to human security, even if we do not describe the various processes and outcomes as matters of 'political economy' per se. With respect to culture, we review the literature that is available, which is heavily focussed on Indigenous people and knowledge, and we discuss that literature which addresses broader issues of culture and knowledge to the extent that that literature exists. Note too we discuss the issues of interpreting climate science in various ways in section 12.3.1. There is a whole chapter on the economics of adaptation (Ch 17), and the issues of costs are discussed throughout the report from WGIII. Given this, and in order to keep the chapter within page limits, we have not added additional text on health. No changes have been made in response to this comment.</p>
25	73406	12	0	0	0	0	<p>Overall, the authors should be commended for doing an excellent job synthesizing the nuanced findings from a vast literature that has grappled with how climate change relates to human security. On the specific issue of how climate change influences the risks of armed conflict, the authors have done an excellent job conveying the consensus among conflict researchers. Climate change, in and of itself, is not a driver of violent armed conflict. Rather, as the authors make clear, its effects are conditioned through a complex set of intervening factors (foremost among them being whether a society's institutions govern legitimately and effectively). Accordingly, any assessment of the impact of climate change and its potential for increasing risks for conflict must be done with systematic accounting for the country context and its existing conflict dynamics. Ensure the chapter retains this balance through editorial process. (UNITED STATES OF AMERICA)</p>	<p>Thank you, no change is required.</p>
26	73407	12	0	0	0	0	<p>Please add a section on research gaps and needs...including more robust social science methodologies (UNITED STATES OF AMERICA)</p>	<p>We have added a discussion of data gaps and research needs into box 12.2</p>
27	73408	12	0	0	0	0	<p>Population growth would seem to be an important human security risk, but is not mentioned in Chapter 12, except in briefly in the context of urban population growth. Population growth is cited throughout the document, for example Chapter 5 notes that population growth is anticipated to put greater numbers of coastal residents at risk; Chapter 7 notes that increased pressure on food security is anticipated as a result of population growth as well as increased per capita consumption; Chapter 8 the stresses on urban centers caused by and anticipated from population growth; 11.3.6, Population growth may be one of the strongest influences on vulnerability to the health effects of climate change (see also 11.6.4); 11.8.4 population growth cited as a primary determinant of water scarcity; 11.9.2 population growth as a factor in terms of overall consumption, emissions, and CAPs; and 16.3.1.2. as a factor in greater resource consumption and ecological degradation. (UNITED STATES OF AMERICA)</p>	<p>We have discussed the key issues raised in the literature we have reviewed on climate change and human security. Population growth is rarely mentioned as a major variable, the focus of demographic factors is largely on issue of migration. As noted, population growth is mentioned elsewhere throughout the WGII report. No changes have been made in response to this comment.</p>

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28	73409	12	0	0	0	0	Something expected and yet missing from the Chapter was more reporting and assessment of the linkages between climate change and diseases of humans/livestock/agriculture and their affects on human security. The affects could either be direct, affecting human health, or indirect because of loss of confidence in governments, disruption of critical infrastructure, economic loss, migration, or as a trigger for conflict. While this may be covered in Chapter 11, linkages need to be made to this topic in Chapter 12. (UNITED STATES OF AMERICA)	We have discussed the key issues raised in the literature we have reviewed on climate change and human security. This is not an issue that is raised in the research we have reviewed. No changes have been made in response to this comment.
29	73410	12	0	0	0	0	The authors have done an excellent job of summarizing several critical issues in the literature relating to the potential impacts of climate change on human security. They do, however, approach the issue of human security rather narrowly and exclude some important areas, such as human health and ecological degradation+C128, perhaps because they are comprehensively addressed in other parts of the document. However, to be most effective, the chapter on human security should address human security more broadly and articulate linkages between threats or adaptation opportunities, particularly where one issue amplifies or mitigates another. Many of these areas are addressed in other parts of the report and may simply be cross-referenced. Specifically, greater attention to synthesizing the linkages between different impacts would be helpful in better articulating risks to human security from climate change. For example, the link between human caused environmental degradation (and concomitant loss of ecosystem services, including adaptation services) and increased vulnerability to climate change, or the link between climate change induced impacts to human health that decreases income and adaptive capacity of individuals (and increases costs to their family, community, and/or nation). Some connections between impacts are made in this chapter, but given the wide ranging nature of perceived and anticipated climate impacts, better drawing the connections between the varied threats to human security from climate change would make this chapter much stronger. The link, in particular, between human security and ecological systems should be further explored, as this is at the nexus of the issue and there are clear positive and negative feedback loops between ecological degradation/restoration and climate change. Food security is also largely missing. While it relates to livelihoods, it is treated separately in AR5 and should be included in this analysis. (UNITED STATES OF AMERICA)	Issues of health are raised in Chapter 11, issues of ecological degradation are raised throughout chapters 3-6, issues of food security are raised in chapter 7. Given this, and in order to keep the chapter within page limits, we have not added additional text on these issues.
30	73411	12	0	0	0	0	The chapter is certainly weighted toward a strong interpretation of climate change on poverty (as opposed to the opposite direction). Consider finding stories or examples of positive influence, where programs to alleviate poverty also have had strong and positive climate effects. (UNITED STATES OF AMERICA)	Our assessment reflects the literature we have reviewed on climate change and human security. The effects of poverty alleviation efforts on reducing human security is not much discussed, but the related issue of the possibility of adaptation efforts reducing vulnerability and building peace which is an emergent issue in the literature, is discussed in section 12.5.4. We have not added additional text on these issues.
31	73412	12	0	0	0	0	The chapter is internally inconsistent with its perspective on the role of climate in migration and violent conflict. By virtue of the conflicting statements within the chapter, the authors convey that inability to establish causal linkages means that climate is not an important driver. Suggest edits to the chapter to change the tone to reflect that climate is one of many factors that affect migration and conflict, and sometimes can be the trigger or tipping point for seriously destabilizing events. The literature supports several tennants that should be more clearly articulate in this chapter: 1)that climate change may exacerbate existing tensions; 2)climate change may rob weak governments of legitimacy and create underlying conditions that terrorists may exploit and thereby affect both national and human security; and 3) that while we cannot prove causality there is ample evidenced of an important correlation between climate factors and drivers of human security. (UNITED STATES OF AMERICA)	The revised executive summary points hopefully now address these concerns, as they are clearer about the key findings of our assessment.

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32	73413	12	0	0	0	0	The chapter needs to be clearer about established connections between climate, natural resource scarcity and the elements of human security. Perhaps the best effort to relate natural resources, environmental change, and security is found in the UNEP report of 2009, From Conflict to Peace Building "Since 1990, at least 18 violent conflicts have been fueled by the exploitation of natural resources. Looking back over the past 60 years, at least 40% of all intrastate conflicts can be associated with natural resources." This reference should be included. (UNITED STATES OF AMERICA)	The UNEP report is largely about peace building, and it is part of a larger body of research about peace building and natural resource management that is discussed in section 12.5.4. The connections between natural resource exploitation and conflict are tangential to the issue of the effects of climate change on conflict - the former is not a good analogy for the latter. However, section 12.5.2 discusses the risk that violent conflicts might arise as a result of changes in land use arising from climate change policies. We have not added new text to address this comment.
33	73414	12	0	0	0	0	The chapter seems to reflect two differing framings about the connection between climate and violence, arguing at times the climate can be a triggering factor and at other times climate is only ever one of many factors. Suggest that the authors clearly articulate the divergent views early in the chapter to reflect or 'assess' the state of the science, then to treat the divergent perspective more clearly throughout. Presently the attempt to find a middle ground makes the chapter internally inconsistent, confusing and unclear. (UNITED STATES OF AMERICA)	The chapter does not say climate change can be a trigger for armed conflict, it concludes that climate change is one among many factors that can increase the risk of violent conflict. The revised executive summary points are hopefully clearer about this issue.
34	73415	12	0	0	0	0	The entire chapter needs a thorough edit for consistency and prudent use of terms especially the use of the words 'impact' and 'impacts'. At present lack of cohesion makes for a difficult read (an acknowledged consequence of multiple contributing authors across disciplines). Frequently 'impacts' appear as both a noun and a transitive verb often in the same sentence; to such an extent that it is unclear as to the consistency in meaning and intent of the word 'impact' from one section to the next. Moreover, when used as a transitive verb, the word "impacts" should be followed by the direct object and not be followed by a preposition. This adds to confused interpretation of the text. For example, page 6, line 12: "... by which climate change impacts upon the material aspects ..." should be instead, "... by which climate change impacts the material aspects ...". The overuse and often uneven use of "impacts" makes for a very dense and unclear reading of the Chapter to the extent that this reviewer often focused more on deciphering the intended meaning and intent of a paragraph and less on creating new knowledge through reading and understanding. This is particularly the case for Section 12.2, "Economic and Livelihood Dimensions of Human Security at Risk from Climate Change". An alternative word choice for impact/impacts that engenders precision in meaning and is applied consistently is needed for Chapter 12. (UNITED STATES OF AMERICA)	Thanks, we have revised the text and have hopefully corrected all the instances where this problem occurs.
35	73416	12	0	0	0	0	The peer-reviewed publications of Dr. Joshua Busby on climate change, vulnerability, conflict and mass death, should be cited in various places throughout the chapter. Namely, "Locating Climate Insecurity: Where are the Most Vulnerable Places in Africa?" and "Ground Truthing" Vulnerability and Adaptation in Africa. Where references to grey literature are appropriate, the volume "The Arab Spring and Climate Change," produced by the Stimson Center, Center for Climate and Security, and the Center for American Progress, may be appropriate to cite. Research needs highlight in this literature should also be included in a proposed new section on research needs and gaps. The reference here can be found at: <a href="http://climateandsecurity.files.wordpress.com/2012/04/climatechange-arab-spring-ccs-cap-stimson.pdf">http://climateandsecurity.files.wordpress.com/2012/04/climatechange-arab-spring-ccs-cap-stimson.pdf</a> . Additionally, E3G's "Underpinning the MENA Democratic Transition: Delivering Climate, Energy and Resource Security, should be referenced, appropriate to the restrictions on grey literature. That can be found at: <a href="http://www.e3g.org/images/uploads/E3G_MENA_Report_Final_130221.pdf">http://www.e3g.org/images/uploads/E3G_MENA_Report_Final_130221.pdf</a> (UNITED STATES OF AMERICA)	Relevant references have been added. We have added a discussion of data gaps and research needs into box 12.2
36	73417	12	0	0	0	0	There seems to be a problem related to relying solely on historical data as an evidence base for assessments of climate change impacts on human security. The exclusion of foresight exercises, and future-oriented assessments, such as the National Intelligence Council Global Trends 2030: Alternative Worlds, the National Research Council "Climate and Social Stress: Implications for Security Analysis", has the very real potential to lead to an overly-conservative assessment of human security risks. These kinds of future-oriented assessments should be used and referenced, given the unprecedented rate of change that climate models are demonstrating, and the limited value of historical evidence in this context. (UNITED STATES OF AMERICA)	We have added a figure, that is now standard across many chapters of the WGII report, that summarises key risks into the future. We have also added a summary paragraph at the end of each section that characterises future risks.

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
37	73418	12	0	0	0	0	This chapter as a stand alone topic is a welcome addition to the IPCC structure. The field clearly needs both methodological development and improved data or proxy data. Suggest adding a research needs section at the end of the chapter. Also, the chapter contains a great deal of information but is so dense it is hard to follow. Suggest the authors consider careful use of the words impact and effect as improper use makes some sections quite confusing. (UNITED STATES OF AMERICA)	We have added a discussion of data gaps and research needs into box 12.2. We have carefully edited the text and as noted in response to comment 34 we have reviewed the use of the word 'impact/s' throughout the chapter.
38	73419	12	0	0	0	0	Throughout the chapter, there does not seem to be a clear distinction between causal and correlative relationships between climate change and human security, nor is there a clear definition of what the authors are describing as the "direct impacts" of climate change on human security. In a landscape of complex causality, it is very important to distinguish and define at the outset. (UNITED STATES OF AMERICA)	We have reviewed the text and amended where appropriate.
39	73420	12	0	0	0	0	We suggest that the chapter 12 and chapter 11 authors confer on role of climate in migration and conflict. Some of the information contained in chapter 11 would be useful for chapter 12, encouraging chapter 12 to be clear that climate is among many factors that affect conflict and migration but can trigger or be the tipping point. Chapter 11 treatment is fair, clear and consistent with the literature from the public health perspective on climate and migration and conflict. Chapter 12 should add a section that articulates the clear role that health and related productivity play in regional security and social conflict, and how climate impacts on health can also be destabilizing. (UNITED STATES OF AMERICA)	Thank you, we have liaised with chapter 11 to ensure consistency, and the text in both chapters has been modified accordingly.
40	73421	12	0	0	0	0	Women in food security: The role of women in producing food (in developing countries 60 to 80% of of food is produced by women) could be enhanced by available data in chapter 12 and share the work of USAID, DCHA and the Office of the Global Food Security Coordinator. (Place such data between lines 37 and 46 on page 6 under.12.2.1 Impacts on Material Aspects of Livelihood Security). (UNITED STATES OF AMERICA)	Box 12.3 has been changed to discuss the issue of food insecurity, and we have cross-referenced the detailed cross-chapterbox on gender and vulnerability in this Section
41	73534	12	0	0	0	0	Although Human Health is the topic of Chapter 11, there needs to be more reference to health concerns in the Human Security chapter since it represents a threat to the vital core of lives (the definition of human security). (UNITED STATES OF AMERICA)	Indeed, however there is a whole chapter on health (CH11), where these issues are extensively discussed. Given this, and in order to keep the chapter within page limits we have not added additional text on health.
42	78016	12	0	0	0	0	another reference of importance for the topic: UNEP (2011): Livelihood Security - Climate Change, Migration and Conflict in the Sahel. ISBN 978-92-807-3198-9, 108p (Peter Zeil, Center for Geoinformatics Z_GIS Salzburg University )	We have reviewed this reference, it adds no new knowledge and because of space constraints we have not added the citation.
43	78243	12	0	0	0	0	Both chapters 12 and 19 cover the issue of climate change and conflict, however in very different and inconsistent ways. Chapter 12 provides a more balanced account of the literature and the range of positions expressed there. The assessment of the literature in Chapter 19 is more unbalanced and rests much on two unpublished articles by one of the contributing authors that takes a very determined position. The IPCC should provide a fair account of the different positions expressed in the peer-reviewed literature. The division on this subject in the research community has been made explicit in a recent commentary in Nature (Solow, 2013, Nature 497: 179). Chapter 19 does not refer to primary articles that are more cautious about the climate-conflict link which have been also quoted in the mentioned Nature commentary. (Jürgen Scheffran, University of Hamburg)	We have cross-referenced chapter 19 and chapters 12. We refer to chapter 19 as a more focussed review of statistical studies, chapter 19 refers to chapter 12 reviewing the broader set of literature. The Executive Summary points in chapters 12 and 19 are consistent.
44	79569	12	0	0	0	0	A theme which could be drawn out more strongly is that concerning the lack of livelihoods options and choices as part of the climate change and human security relationship - in addition to the two factors considered in 12.2.1 and elsewhere throughout the chapter, including Section 12.5 and Box 12-5. The case study of relevance here is that of Darfur which shows how the Janjaweed rebel group was essentially a nomadic pastoralist group who had run out of livelihood options and choices due to a range of factors associated with environmental degradation, drought, policy failure, and the breakdown of traditional authorities responsible for managing and mitigating resource-use conflicts. The options to engage in violence instead - as a source of livelihood - is an important example of what vulnerability means in practice. The Tufts research by Helen Young on Livelihoods, Power and Choice is the key reference here: link attached. Covering in a little more detail the security aspects, how and why certain groups engaged in violence, and how the breakdown of traditional institutions played into the local-level conflicts over increasingly scarce resources - certainly associated with drought but potentially also changing climatic patterns, would be worthy of further examination. (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)	Chapter 13 reviews the research on climate change and livelihoods extensively, and is the more suitable place for a discussion of the kind. Nevertheless section 12.2 has been revised to address this issue. The Darfur case is discussed in box 12.5 on p.17, and has been revised to reflect this and reviewer comments 568-571.



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45	79570	12	0	0	0	0	The remainder of Section 12.5 is, however, dealt with comprehensively, and presents a strong body of evidence to support the arguments made. The examination of the risks associated with climate mitigation strategies is particularly useful, as is the subsequent assessment of violent conflict and its implications for vulnerability to climate change. (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)	Thank you.
46	79571	12	0	0	0	0	The conclusion of the chapter suggests that the evidence regarding the effects of climate change on human security will be of diminishing value due to the rate of change in levels of warming. This is surely incomplete. The authors should go further in making recommendations on what the response of the international community, including the research community, should be to this particular dilemma. For example, is there a need for further research on this relationship, including the issue of causality in the relationship between climate change and conflict? Does a stronger awareness of climate change need to be built into conflict prevention strategies? Should there be stronger cross-cutting climate change/conflict sensitivity approaches adopted in policy, research and practice? A more robust conclusion would only strengthen what is already an excellent and compelling piece of work. (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)	We have revised the summary points and these hopefully offer stronger conclusions. The IPCC is not a policy prescriptive organisation, but we have added a discussion of data gaps and research needs into box 12.2.
47	80085	12	0	0	0	0	The chapter lacks in clarity and quality in several places e.g. in comparison with chapters 9, 13 and 20 Illustration, figures mainly good but e.g. 12-1 needs further work (Mikko Halonen, Gaia Consulting Oy)	The chapter has been edited for readability and clarity of writing.
48	80086	12	0	0	0	0	The chapter is repetitive ("This chapter... this chapter...this chapter...". Definitions could be streamlined and placed more systematically in the beginnin of the chapter. (Mikko Halonen, Gaia Consulting Oy)	The chapter has been thoroughly edited.
49	80105	12	0	0	0	0	Needs a strategic overall approach, to mature and reviews in parallel with other chapters (Mikko Halonen, Gaia Consulting Oy)	It is unclear what action can be taken in response to this comment, no action has been taken.
50	80201	12	0	0	0	0	Exec summary: On point of migration, discrepancy in line 14 (page 2) where migration is noted as „“, and lines 49-53 (page 2) and lines 1-2 (page 3) that suggest that migration is widely used and often effective strategy to maintain livelihoods in response to social and environmental changes. Rainfalls research helps resolve this discrepancy with evidence that suggests households with certain characteristics of „resilience“ use migraiton in ways that reduce their sensitivy to climate stressors (like changes in rainfall variability), while households with „vulnerable“ characteristics use migration in ways that can erode their basis for human security (see special journal edition by Afifi and Warner, Climate Policy 2013 forthcoming) (Koko Warner, United Nations University - Institute for Environment and Human Security)	ES summary points on migration have been revised.
51	81040	12	0	0	0	0	There are some missing/ incorrect citations in the chapter. These discrepancies have been highlighted in the ref check document for chapter 12 and is available in the supporting material web page. Chapter team may wish to rectify these errors before starting to work on SOD revisions and FGD preparation. (Monalisa Chatterjee, IPCC WGII TSU)	Citations have been checked and added where missing.
52	82538	12	0	0	0	0	1) Overall -- The chapter team has developed a very robust second-order draft. In the final draft, the chapter team is encouraged to continue prioritizing compact and rigorous assessment, accessible text, and clear communication of findings. All sections should be further tightened and condensed as much as possible. Opportunities for incorporating further figures should be considered as may be suggested by reviewers. (Katharine Mach, IPCC WGII TSU)	The chapter has been thoroughly edited and is now clearer, and falls with page limits.
53	82539	12	0	0	0	0	2) Italicizing calibrated uncertainty language -- All calibrated uncertainty language used should be italicized for clarity, including summary terms for evidence and agreement, levels of confidence, and likelihood terms. (Katharine Mach, IPCC WGII TSU)	Amended
54	82540	12	0	0	0	0	3) Coordination across Working Group II -- In developing the final draft of the chapter, the author team should continue to ensure coordinated assessment, both in the chapter text and at the level of key findings. Cross-references to other chapters should indicate the relevant *sections* of the other chapters wherever possible and appropriate, in place of generic references to entire chapters. The chapter team is strongly encouraged to review assessment of migration and conflict especially in other chapters, such as the regional chapters, to ensure assessment across the report is consistent with the key findings of chapter 12. (Katharine Mach, IPCC WGII TSU)	We have reviewed discussions on conflict and migration across WGII and liaised with the author teams of relevant sections to ensure consistency.
55	82541	12	0	0	0	0	4) Harmonization with the Working Group I contribution to the AR5 -- In developing the final draft, the chapter team should also ensure that all cross-references to the Working Group I contribution are updated, with discussion of climate, climate change, and climate extremes referencing the assessment findings in that volume as appropriate. (Katharine Mach, IPCC WGII TSU)	We have done this where relevant

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
56	82542	12	0	0	0	0	5) Report release -- The chapter team should be aware that the final drafts of the chapters will be posted publicly at the time of the SPM approval, before final copyediting has occurred. Thus, the chapter team is encouraged to continue its careful attention to refined syntax and perfected referencing. (Katharine Mach, IPCC WGII TSU)	The chapter has been thoroughly edited and is now clearer, and falls with page limits.
57	82543	12	0	0	0	0	6) Characterization of future risks -- In characterizing future risks related to human security, to the degree appropriate the chapter team should indicate the extent to which risks (or key risks) can be reduced through mitigation, adaptation, development, poverty reduction, etc. That is, is it possible to indicate how risks may increase as the level of climate change increases or, potentially, to indicate the relative importance of changes in mean conditions, as compared to changes in extreme events, as compared to potential non-linear changes associated with biome shifts or tipping points? And then, how much can these risks be reduced through adaptation or development, in the near-term and long-term? How are factors or stressors that multiply risks relevant in this context? As supported by its assessment of the literature, the author team should consider communicating risks for the era of climate responsibility (the next few decades, for which projected temperatures do not vary substantially across socioeconomic/climate scenarios) and for the era of climate options (the 2nd half of the 21st century and beyond). As might be helpful to the chapter, the framing of table SPM.4 could be considered in characterization of future risks, along with the key and emergent risk typology of chapter 19. (Katharine Mach, IPCC WGII TSU)	We have added a figure that is now standard across many chapters of the WGII report that summarises key risks into the future. We have also added a summary paragraph at the end of each section that characterises future risks.
58	82544	12	0	0	0	0	7) Informing the summary products -- To support robust and insightful summary products for the report, the chapter team is encouraged to maximize nuance and traceability in its key findings, continuing to use calibrated uncertainty language effectively. In addition to nuanced characterization of future risks (see the previous comment), the chapter team is encouraged to consider themes emerging across chapters, indicating for example how extreme events have demonstrated adaptation deficits and vulnerabilities to date and may relate to future risks, how limits to adaptation may be relevant in the context of this chapter, how multidimensional inequality is relevant in the context of climate change, how adaptation experience has been seen to date, and how interactions among mitigation, adaptation, and sustainable development may occur. (Katharine Mach, IPCC WGII TSU)	We have added Table 12.4, that is now standard across many chapters of the WGII report, that summarises key risks into the future. We have also added a summary paragraph at the end of each section that characterises future risks.
59	84621	12	0	0	0	0	GENERAL COMMENTS: I congratulate the author team for a well-written and informative SOD. Please see my detailed comments for suggestions related to specificity of ES findings and traceable accounts, refining figures and tables, calibrated uncertainty language, and various specific clarifications. I have one general comment. In both the executive summary and the text, please take care to differentiate statements about climate variability and climate change, or where both are relevant. For example, if a statement asserts sensitivity/vulnerability to climate change, it is not always clear to what extent this is a statement about impacts of changes in climate conditions that have already been observed, impacts that are anticipated based on identified sensitivity/vulnerability to climate variability, and/or specific projections of future impacts of climate change. It would be useful to communicate these nuances to the extent possible based on the available evidence, and I have tried to point out specific places where this is relevant in my comments. (Michael Mastrandrea, IPCC WGII TSU)	ES summary points have been revised such that this issue has now been addressed.
60	84622	12	0	0	0	0	SUMMARY PRODUCTS: In preparing the final draft of your chapter and particularly your executive summary, please consider the ways in which your chapter material has been incorporated into the draft SPM and TS. For chapter 12, this includes presentation of observed impacts and vulnerabilities in section A.i, principles for effective adaptation in section B.ii, and sectoral risks in section C.i and Box SPM.5. Are there opportunities for presenting chapter findings and material in a way that further supports broad themes highlighted in the summary products and that facilitates additional cross-chapter synthesis in specific findings or figures/tables? Do the existing summary product drafts suggest additional coordination that should occur between Chapter 12 and other chapters at LAM4? (Michael Mastrandrea, IPCC WGII TSU)	We have worked closely with the TS/SPM team and sent through revised ES points, indicating the sections where we think these might be fit in the outline of both summary products. We have also worked closely with chapters 11 and 13 in developing text and figures for the SPM and TS.
61	85212	12	0	0	0	0	This one is really pushing it. You make no case at all (Vincent Gray, Climate Consultant)	No change has been made in response to this comment.
62	58473	12	1	1	25	37	The big question is "Climate Change, how many death?" I guess tens of millions (good confidence) to hundreds of millions (medium confidence). It will be good to make this assessment with flood, drought, etc.... It is however too late for the SOD, unless you send a special email to all reviewers ? (Martin Pecheux, Institut des Foraminifères Symbiotiques)	We are unable to answer this question on the basis of the existing science.
63	62290	12	1	11	1	11	The chosen contributing authors further reinforce the regional dominance among the CLAs and Las. The regions where the impact of climate change on human security may be the greatest, e.g. the expertise of scholars from Sub-Saharan Africa, South Asia, China and in the Arab World is still totally lacking. (Hans Guenter Brauch, Free University of Berlin)	This is a matter for the IPCC bureau, which they might like to consider for subsequent assessments.

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
64	68099	12	2	11	0	0	The executive summary of this chapter, which is fragmentary, fails to reflect what the chapter drives at. It is suggested to reformulate and reinforce it. (CHINA)	ES summary points have all been revised and we hope provide grater clarity.
65	82545	12	2	11	0	0	Executive Summary -- All calibrated uncertainty language used within the executive summary should be italicized. Additionally, in revising key findings, I would encourage the author team to consider nuanced characterization of future risks and themes relevant to the summary products, as supported by its assessment of the literature. Please see my overall comments on the chapter for these topics. (Katharine Mach, IPCC WGII TSU)	ES summary points have all been revised and uncertainty language italicised. We have added a figure, that is now standard across many chapters of the WGII report, that summarises key risks into the future. We have also added a summary paragraph at the end of each section that characterises future risks.
66	73422	12	2	11	3	28	The Executive Summary has confidence statements that are not supported in the underlying text. Add confidence statements to underlying text and ensure consistency with the executive summary and summary for policy makers confidence statements. (UNITED STATES OF AMERICA)	Consistency with SPM and TS has been checked, for reasons of legibility we have kept the confidence statements at the level of the opening statement of each ES point.
67	73423	12	2	13	2	13	Climate change threatens human security, because it...suggest adding: threatens human health, weakens ecological systems on which humans depend, decreases food security, and increases costs to individuals, communities, and nations. (UNITED STATES OF AMERICA)	This first ES point has been substantially rewritten.
68	60029	12	2	13	2	15	The correlation between climate change and its threat to human security is overstated. Stated in its current form, it could be interpreted that climate change directly causes issues of human security, which is not entirely consistent with the rest of the chapter that implies that climate change exacerbates or multiplies existing and other certain threats. (AUSTRALIA)	This first ES point has been substantially rewritten, and this issue of multi-causality has been specifically included.
69	78005	12	2	13	2	20	Add e) technology may not be able to protect people in place (Robin Bronen, University of Alaska)	This first ES point has been substantially rewritten.
70	56951	12	2	13	2	41	Lines 13-15 state that "climate change threatens human security, because it [...] increases migration that people would have rather avoided [...] "high agreement, robust evidence)". However, in the lines 40-41, the impact of climate change on "migration that comprises human security" is stated to be supported by medium agreement and medium evidence only. In my eyes, there is a contradiction between both parts. (Tobias Ide, Research Group Climate Change and Security)	These are not contradictory statements, but both ES points have been substantially rewritten and this has hopefully increased the clarity of meaning.
71	60555	12	2	15	0	0	if this whole paragraph serves as summary of the chapter, then 'the high agreement, robust evidence' statements do not really reflect the cumulative assessment of the different sections of the chapter. (Vally Koubi, University of Bern)	This first ES point has been substantially rewritten to avoid this problem.
72	61267	12	2	15	0	0	Refer to 'robust evidence'. This first point is summarising the findings in the chapter. Given that some of the evidence is medium and in some cases contested, should is be called 'robust'?For example on page 12 the point is made that the issue of causality is a difficult one to establish. (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	This first ES point has been substantially rewritten to avoid this problem.
73	56804	12	2	15	2	15	In view of the very ambiguous empirical evidence the qualification as high agreement and robust evidence is too strong. it should be moderate agreement and moderately robust evidence (Thomas Bernauer, ETH Zurich)	This first ES point has been substantially rewritten to avoid this problem.
74	66677	12	2	15	2	15	For consistency with other chapters, 'statistical' text in brackets should be in italics and not bold. (Peter Burt, University of Greenwich)	The word 'statistical' is not used in this ES point.
75	73424	12	2	15	2	16	The second sentence is the stronger point based on the specifics of the chapter, and should be the bolded one, rather than areas where the underlying chapter does not present quite such a unified view. (UNITED STATES OF AMERICA)	This first ES point has been substantially rewritten.
76	56805	12	2	18	0	0	I would frame this whole section less deterministically, e.g., "because it may undermine..." (Thomas Bernauer, ETH Zurich)	This first ES point has been substantially rewritten.
77	61268	12	2	22	2	23	This statement links culture to knowledge and identity. Could place attachment and its relationship with identity be mentioned as a way to explain some barriers or facilitors to adaptation? What is the effect on people and their human security when they are displaced from their homes and places they feel they belong to? (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	This second ES point has been substantially rewritten, the notion of place has been included.

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78	84623	12	2	22	2	23	The phrasing of this finding makes it unclear to what extent this is a statement about impacts that have already been observed, impacts that are expected based on identified sensitivity/vulnerability to climate variability, and/or specific projections of future impacts. The nonbold sentences are forward-looking, but section 12.3 also contains discussion about observed effects. To the extent supported by the literature, it would be very useful to present information both about changes to date and future risks. In addition, section 12.3.1 mentions "high confidence" associated with similar statements. How does this intersect with the agreement/evidence statement given here? (Michael Mastrandrea, IPCC WGII TSU)	This first ES point has been substantially rewritten.
79	63284	12	2	22	2	38	The executive summary on culture is a bit ambiguous and not too clear to the reader. However, it becomes clearer what is meant in the specific sections on culture (12.3). There is also some overlap with the next paragraph on "Traditional and indigenous forms of knowledge..." with regard to the term "traditional forms of knowledge". Since both paragraphs of the executive summary deal with 12.3, I would recommend merging the two or if not, at least making the first paragraph starting with "Climate change affects cultures..." more concise and to the point. (Christian Webersik, University of Agder)	This first ES point has been substantially rewritten.
80	82546	12	2	22	2	41	For the key findings in bold on lines 22-23 and 40-41, the chapter team should consider if it is possible to make more nuanced statements about the impacts of climate change on culture and migration. (Katharine Mach, IPCC WGII TSU)	This first ES point has been substantially rewritten.
81	62978	12	2	23	0	0	keep order of agreement-evidence statements consistent for each entry? (Helen Ross, The University of Queensland)	Thanks, all consistent now
82	63285	12	2	23	2	23	"(medium evidence, high agreement)" should read "(high agreement, medium evidence)" for the sake of consistency (Christian Webersik, University of Agder)	Thanks, all consistent now
83	66678	12	2	23	2	23	For consistency with other chapters, 'statistical' text in brackets should be in italics and not bold. (Peter Burt, University of Greenwich)	The word 'statistical' is not used in this ES point.
84	80088	12	2	23	2	23	Change order of items in brackets to be in line with similar text elsewhere (high agreement, medium evidence). (Mikko Halonen, Gaia Consulting Oy)	Thanks, all consistent now
85	84624	12	2	26	2	26	Please move the line of sight to the end of the paragraph for clarity. (Michael Mastrandrea, IPCC WGII TSU)	Done
86	61269	12	2	28	0	0	How maladaptive defined? I think this is the only place it is mentioned. Is it bad forms of adaptation, not adapting or when adaptive responses end up exacerbating impacts on human security? (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	Maladaptive' is no longer used.
87	85157	12	2	31	2	31	How do you distinguish between traditional and indigenous forms of knowledge from traditional beliefs without any scientific value? Many people in France believe that their astrological sign influences their character and read their horoscope. Would you consider creationism as a form of traditional knowledge? (Michel Petit, CGIET rue de Bercy)	This third ES summary point has been rewritten, both kinds of knowledge are included.
88	58691	12	2	31	2	32	"Traditional and indigenous forms of knowledge are a major resource for adapting to climate change except when the changes exceed the knowledge repertoire". This statement seems almost tautological in its present form, which obviously explains the high agreement and robust evidence. It's not quite as tautological as saying that knowledge is adequate unless it's inadequate, but it goes in that direction. When the knowledge repertoire "exceeds" the changes (I guess that means provides sufficient equipment to face the changes), then it's pretty intuitive to conclude that it will be a resource for adaptation. But the real question is of course whether and under what circumstances traditional and indigenous forms of knowledge provide sufficient equipment to face the changes, and there's much less consensus on and much more mixed evidence for that. In short, the statement as you currently formulate it "begs the question" and it may not be worth having in the first place unless you give it some less tautological form. (Joerg Friedrichs, University of Oxford)	This third ES summary point has been rewritten.
89	61270	12	2	31	2	32	See comment on p.8, l.43-46, is there an argument for considering traditional knowledge and how it relates to perceptions of change and the future. If the changes exceed the knowledge repertoire then this would matter only if people perceived it to be so since. If not it still can influence behaviours and actions related to adaptation. (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	This third ES summary point has been rewritten

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
90	78310	12	2	31	2	34	There is increasing evidence against the argument that local and traditional knowledge loses its utility for adaptation once change bypasses the knowledge repertoire This frequent assumption is flawed because it focuses upon knowledge as a fixed set of information, rather than considering the dynamic capacity of knowledge holders to face novel challenges and nevertheless find ways to adapt adapt. Indeed, many indigenous people pride themselves on their ability to overcome new and as yet unencountered challenges (Fienup-Riordan and Rearden 2010). For Inuit living in a rapidly changing Arctic, it is not the knowledge repertoire that sets the limits of adaptation. The transmission of core cultural attitudes and values such as patience, respect, solidarity, endurance, attentiveness, and inventiveness in the face of novel challenges, can expand adaptive capacity well beyond the existing knowledge repertoire (Ford et al. 2007; Fienup-Riordan and Rearden 2010). Fienup-Riordan, A. and Rearden, A. 2010. The ice is always changing: Yup'ik understandings of sea ice, past and present. In: I. Krupnik et al. (eds.) SIKU: Knowing Our Ice: Documenting Inuit Sea Ice Knowledge and Use. London, Springer, pp. 303–328; Ford, J.D., Pearce, T., Smit, B., Wandel, J., Allurut, M., Shappa, K., Ittusujurat, H., and Qrunnut, K. 2007. Reducing vulnerability to climate change in the Arctic: The case of Nunavut, Canada. Arctic, 60(2): 150–66. (Douglas Nakashima, UNESCO)	The Executive Summary point has been amended to better reflect the underlying text. And hence deals with this nuance in the argument
91	78311	12	2	31	2	34	THE DANGER OF THIS LINE OF ARGUMENT (for which I contest that there is robust evidence), is that it encourages decision-makers to disregard indigenous knowledge and indigenous knowledge holders. It justifies reliance on adaptation measures that are completely external to the communities, because 'change is beyond their current knowledge repertoire'. Yet in actual fact, adaptation measures to changes beyond lived-experience may better align with local community livelihoods, concerns and aspirations, if they are nevertheless based upon and inspired from traditional and indigenous knowledge and practice. (Douglas Nakashima, UNESCO)	The Executive Summary point has been amended to better reflect the underlying text.
92	61271	12	2	32	0	0	Same point as in 1. - Refer to 'robust evidence'. This first point is summarising the findings in the chapter. Given that some of the evidence is medium and in some cases contested, should be called 'robust'? For example on page 12 the point is made that the issue of causality is a difficult one to establish. (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	This third ES summary point has been rewritten, we have considered the confidence statements and find that they reflect the state of the science.
93	66679	12	2	32	2	32	For consistency with other chapters, 'statistical' text in brackets should be in italics and not bold. (Peter Burt, University of Greenwich)	The word 'statistical' is not used in this ES point.
94	73425	12	2	32	2	32	Is adaptive capacity also a factor for indigenous and traditional communities, separate from knowledge? (UNITED STATES OF AMERICA)	This third ES summary point has been rewritten
95	84625	12	2	33	2	35	If the entire paragraph is supported by section 12.3, including the line of sight at the end of the paragraph is sufficient. (Michael Mastrandrea, IPCC WGII TSU)	Lines of sight have been refined.
96	66680	12	2	35	2	35	Insert comma after 'Currently'. (Peter Burt, University of Greenwich)	This third ES summary point has been rewritten
97	62979	12	2	36	0	0	could consider adding (here and in body)... In many cases Indigenous peoples' cultures and knowledge bases are also threatened by globalisation patterns. (Helen Ross, The University of Queensland)	This third ES summary point has been rewritten
98	66681	12	2	36	2	36	Mismatch of singular and plural tenses: change 'is' to 'are'. (Peter Burt, University of Greenwich)	This third ES summary point has been rewritten
99	85159	12	2	37	2	37	Mutual : who are the partners involved ? Scientists should check the scientific value of local traditions but cannot accept all local beliefs as valid scientific results. (Michel Petit, CGIET rue de Bercy)	This third ES summary point has been rewritten
100	73426	12	2	40	2	43	The strongest aspect of these statements is the relationship between extreme events, climate, and migration, so that should be the lead, rather than a statement that is not entirely backed up by data/literature as demonstrated by the underlying section. A more explicit link to the SREX would be worthwhile here, since, while the migration and extreme events piece is quite evident, the SREX demonstrated that climate change is one of the factors that drives vulnerability and impacts of extremes, which is an important point to keep in mind when summarizing this information. (UNITED STATES OF AMERICA)	This fourth ES summary point has been rewritten
101	57672	12	2	40	2	47	You omit retirement migration. (Richard S.J. Tol, Vrije Universiteit Amsterdam)	This fourth ES summary point has been rewritten
102	78006	12	2	40	2	47	Differentiate between individual migration and community relocation/resettlement (Robin Bronen, University of Alaska)	This is discussed in section 12.4
103	84627	12	2	40	2	47	Section 12.4.1 is also relevant to this paragraph, specifically lines 42-43. (Michael Mastrandrea, IPCC WGII TSU)	This line of sight has been added
104	66682	12	2	41	2	41	For consistency with other chapters, 'statistical' text in brackets should be in italics and not bold. (Peter Burt, University of Greenwich)	The word 'statistical' is not used in this ES point.

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
105	56806	12	2	43	2	43	it would be good to distinguish short and long term displacement and short and long term climate impacts (Thomas Bernauer, ETH Zurich)	This is discussed in section 12.4
106	84626	12	2	43	2	51	It is not completely clear whether the statements regarding migration are consistent between these two ES paragraphs. Lines 43-45 state that there is evidence that many vulnerable groups do not have resources to migrate to avoid some extreme events, while lines 50-51 state that there is evidence that migration and mobility are adaptation strategies in all regions of the world that experience climate variability. Please clarify the distinctions being made and how these statements fit together. (Michael Mastrandrea, IPCC WGII TSU)	These two ES points have been rewritten, the issue should hopefully be resolved.
107	82547	12	2	44	2	46	For the 2 sentences beginning with "there is evidence," the chapter team should consider presenting calibrated uncertainty language within parentheses at the end of the sentences in place of the phrases or, alternatively, simply deleting these phrases and instead beginning the sentences with the text that follows. (Katharine Mach, IPCC WGII TSU)	Thanks, changed.
108	62026	12	2	45	2	46	The sentence states that loss of permafrost is causing migration and resettlement. More accurately it is decreased soil stability due to loss of permafrost that causes migration and resettlement. (Jon Rosales, St. Lawrence University)	Thanks, but this is a qualification that does not change the meaning of the sentence, yet would detract from its legibility.
109	78011	12	2	46	0	47	Environmental impact of displaced communities - renewed challenge to human security; rference for evidence see below (Peter Zeil, Center for Geoinformatics Z_GIS Salzburg University )	This is discussed in section 12.4
110	62980	12	2	47	0	0	Also choice of destination areas may be uneven, with high incidence of climate refugees overloading particular areas with limited capacity to absorb a rapidly growing population. (Helen Ross, The University of Queensland)	This is discussed in section 12.4
111	80202	12	2	49	0	0	what does „effective“ mean? (Koko Warner, United Nations University - Institute for Environment and Human Security)	This fifth ES summary point has been rewritten
112	80203	12	2	49	0	0	research suggests that mobility is employed when in situ livelihoods come under pressure from climatic and other stressors (see e.g. Jonsson 2009, Jäger and Afifi 2010, Baneerjee 2011, Warner et al 2012). Clarify sentence by rewording, or evaluate whether the claim is consistent with the bulk of relevant and field-based literature on the topic. (Koko Warner, United Nations University - Institute for Environment and Human Security)	This fifth ES summary point has been rewritten
113	84628	12	2	49	2	50	It is unclear how the medium evidence in the bold sentence interacts with the robust evidence in the first nonbold sentence. Please clarify. (Michael Mastrandrea, IPCC WGII TSU)	This fifth ES summary point has been rewritten
114	84629	12	2	49	3	2	Section 12.4.3 does not exist. Sections 12.4.1 and 12.4.2 are relevant to this paragraph, and should be included in the line of sight. (Michael Mastrandrea, IPCC WGII TSU)	This fifth ES summary point has been rewritten
115	56807	12	2	50	0	0	If there is first "medium evidence," why does the first sentence start with "robust evidence?" (Thomas Bernauer, ETH Zurich)	This fifth ES summary point has been rewritten
116	66683	12	2	50	2	50	For consistency with other chapters, 'statistical' text in brackets should be in italics and not bold. (Peter Burt, University of Greenwich)	The word 'statistical' is not used in this ES point.
117	82548	12	2	50	2	50	The pairing of "medium evidence" in the bold key finding and "robust evidence" in the sentence that follows should be clarified, as the distinctions leading to the differing assignments may not be completely clear to the reader. (Katharine Mach, IPCC WGII TSU)	This fifth ES summary point has been rewritten
118	80204	12	2	50	2	51	claims „there is robust evidence“ that migration and mobility are adaptation strategies. However, literature such as that just mentioned seem to suggest that while households and communities employ mobility in an ATTEMPT to manage climatic risk, this ATTEMPT does not equate SUCCESS in adaptation. Studies like Rainfalls and others find that some are able to use migration (but such households already bear characteristics that would make them more likely to use migration successfully, e.g. Better education, livelihood diversification, better access to social networks, access to formal and informal institutions). The Rainfalls findings, EACH-FOR, and Foresight also seem to suggest that households and communities in tenuous situations vis-a-vis climate stressors are often WORSE off in their attempt to move, and in some cases populations have characteristics of „trapped populations“ (evidence of this is found in Milan, A. & S. Ruano (2013) Rainfall variability, food insecurity, migration and trapped populations in Cabricán, Guatemala, Climate and Development, Vol. x, No. x, pp. xx-xx). More nuance or correction is needed on this point, as it seems to contradict the previous point in the executive summary (lines 40-47). (Koko Warner, United Nations University - Institute for Environment and Human Security)	This fifth ES summary point has been rewritten
119	82549	12	2	53	2	53	In place of "some evidence" it would be preferable to use summary terms for evidence (and agreement). (Katharine Mach, IPCC WGII TSU)	This fifth ES summary point has been rewritten
120	63268	12	3	1	3	1	Delete space between security and fullstop (Christian Webersik, University of Agder)	This fifth ES summary point has been rewritten

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
121	80205	12	3	1	3	2	claim that „implementation of planned resettlement show that legitimate and inclusive planning processes help alleviate the conflict and insecurity that individuals and communities may experience.“ while this reflects one of Cernea’s 8 lessons of development resettlement, the wording can be misleading—IF processes are inclusive they can contribute. However, EVIDENCE suggests that participatory processes and reducing insecurity have not very often been the case, at least in the case of development related planned relocation (Ferris, Oliver-Smith). Please carefully consider the evidence and ensure that the wording in these lines reflects evidence rather than a normative („could be“, „should be“) which could be misinterpreted accidentally as evidence. (Koko Warner, United Nations University - Institute for Environment and Human Security)	This fifth ES summary point has been rewritten
122	62981	12	3	2	0	0	But see comment on p. 2, line 47. Large numbers may gravitate to particular host areas, making planning and absorption difficult. For instance Pacific Islander people in a low-income city have claimed in my research that climate changes in the Pacific will bring large further numbers of Pacific Islanders to this particular city, since housing is cheap, industrial jobs available and they already have country-men there. (Helen Ross, The University of Queensland)	This fifth ES summary point has been rewritten
123	80089	12	3	4	3	5	Is there any specific reason based on explicit research to refer to “civil wars” Would it be useful/possible to spell it out even more clearly ? (Mikko Halonen, Gaia Consulting Oy)	This sixth ES summary point has been rewritten
124	82550	12	3	4	3	8	Where the phrases "sensitive to climate change" are used on these lines, the finding being asserted may not be completely clear. For example, is the chapter team viewing "sensitivity to climate and climate variability" as equivalent to "sensitivity to climate change"? It seems that distinctions between the sensitivities could perhaps be clarified if the underlying literature has demonstrated sensitivity to climate and climate variability more than sensitivity to climate change. (Katharine Mach, IPCC WGII TSU)	We mean 'climate change' as this is about present variability as well as future risks.
125	62982	12	3	4	3	13	To me this does not cover inter-country violent conflict or warfare. If we already have border conflicts over water resources (e.g. Israel, I believe), we can expect climate effects on water to make these worse. (Line 26 below picks up the point though, and p. 23 elaborates a similar point). (Helen Ross, The University of Queensland)	These issues are discussed in detail in section 12.5
126	84630	12	3	4	3	13	Please be careful to distinguish climate variability and climate change in this description, as both are mentioned either alone or together in the paragraph. Are the factors mentioned sensitive to climate conditions in general, or to climate change specifically, for example? Also, please provide line of sight for the paragraph (12.5.1 and 12.5.2). (Michael Mastrandrea, IPCC WGII TSU)	We mean 'climate change' as this is about present variability as well as future risks.
127	56808	12	3	5	3	5	it makes no sense to lump all sorts of violent conflict together. The evidence for the claim that climate change has any direct or indirect impact on the probability of civil war is extremely thin - I'd say low confidence, no robust results. The evidence that climate change may have an effect on smaller scale forms of violence is a bit more robust, though at the maximum moderate (Thomas Bernauer, ETH Zurich)	We have modified the language to talk about 'violent conflict within states' rather than civil war. The literature supports the assertion that some of the conditions known to be associated with the incidence of violence are sensitive to climate variability and change therefore we have kept the evidence level at "medium agreement, medium evidence". This is also supported by findings in Chapter 10.
128	66684	12	3	5	3	5	For consistency with other chapters, 'statistical' text in brackets should be in italics and not bold. (Peter Burt, University of Greenwich)	The word 'statistical' is not used in this ES point.
129	56952	12	3	5	3	6	I guess hardly any one claims a direct effect of climate change on violence. There might be a correlation and even one or several causal links, but the link is only indirect and always mediated by natural (e.g. water availability, ecosystem changes, reduced agricultural production etc.) and social factors (e.g. grievances, weakening states, lower recruitment costs for fighters etc.). (Tobias Ide, Research Group Climate Change and Security)	This sixth ES summary point has been rewritten

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
130	73427	12	3	5	3	6	It is unclear why the authors are erecting this particular strawman: "The evidence on the direct effect of climate change and variability on violence is contested." "Most, if not all, of the literature on climate change and violence/conflict does not concern itself with exploring such a "direct effect". In fact, most of the literature focuses on exploring the indirect effects of climate change on violence, as well as correlations between climate change and conflict. Suggest that the authors refer to the recent special issue of the Journal of Peace Research "Climate Change and Conflict," which demonstrates that climate change can be one factor in increasing the likelihood of different forms of violence, and reflect that much of the literature places climate change in the context of a picture of very complex causality including multiple variables/drivers. It is not constructive, or accurate, to paint a picture of some hotly contested assertion that "climate change directly causes violence." (UNITED STATES OF AMERICA)	This sixth ES summary point has been rewritten
131	62268	12	3	7	3	7	What are inconsistent state institutions? (Hans Guenter Brauch, Free University of Berlin)	State institutions that are not consistent.
132	66685	12	3	7	3	7	'per capita' should be in italics. (Peter Burt, University of Greenwich)	Amended
133	56809	12	3	7	3	9	not necessarily, it all depends on general adaptation capacity (Thomas Bernauer, ETH Zurich)	This sixth ES summary point has been rewritten
134	59010	12	3	8	3	9	The example of Hurliman and Dolnicar (2011) needs a bit more information in order to provide greater clarity as to key findings. (Celia McMichael, La Trobe University)	This seems to be relating to page 13 and is addressed in response to comments on that page.
135	60556	12	3	8	3	9	this sentence hardly makes any sense. I cannot see how climate change policy responses associated with changing property rights to land, water and resources can increase the risk of conflict. The existing theoretical literature on institutions emphasizes that an imperfect institutional framework, usually understood as the lack of enforcement and insecure property rights, is a necessary condition for the existence of conflict. In other words, conflict is more probable when less secure property rights exist and enforcement of law is scarce (Skaperdas 2003, 1992; Garfinkel 1994). Consequently, it should be climate change policy responses associated with imperfect or less secure property rights to land, water and resources can increase the risk of conflict. Skaperdas, Stergios (2003) "Restraining the genuine Homo Economicus: Why the economy cannot be divorced from its governance," Economics and Politics 15(2): 135-162. Skaperdas, Stergios (1992) "Cooperation, conflict, and power in the absence of property rights," American Economic Review 82(4): 720-739 Garfinkel, M.R. (1994) "Domestic politics and international conflict," American Economic Review 84(5): 1292-1309. (Vally Koubi, University of Bern)	This sixth ES summary point has been rewritten
136	80090	12	3	8	3	9	CC policy responses... can increase the risk of violent conflict" BUT also, if done properly, can serve to reduce tensions, contribute to peace building! Some, but limited research available on this, also noted in the actual text => this aspect could also be noted in the Executive Summary ? (Mikko Halonen, Gaia Consulting Oy)	This sixth ES summary point has been rewritten
137	56810	12	3	9	0	0	This whole paragraph hardly makes sense in light of the apparently robust evidence pointed to in the first paragraph here (Thomas Bernauer, ETH Zurich)	This sixth ES summary point has been rewritten
138	56953	12	3	10	3	13	It are consistent respectively consolidated institutions (no matter whether they are democratic or autocratic) rather than merely democratic institutions that reduce the risk for (climate change-related) violent conflict. From a normative perspective, I would also like to argue for consolidated democratic institutions, but the literature points to consistency rather than democracy as the relevant factor. See, for instance: Hegre, Håvard et al. (2001): Toward a Democratic Civil Peace? In: American Political Science Review 95(1), 33-48. Dixon, Jeffrey (2009): What Causes Civil War? In: International Studies Review 11(4), 707-735. Hegre, Håvard/Sambanis, Nicholas (2006): Sensitivity Ananylsis of Empirical Results on Civil War Onset. In: Journal of Conflict Resolution 50(4), 508-535. (Tobias Ide, Research Group Climate Change and Security)	Good point, this sixth ES summary point has been rewritten to reflect this and other comments.
139	56954	12	3	10	3	13	You argue for "structures that protect property rights" as factor reducing the risk for violent conflict. As far as I know, precisely the attempt to enforce property rights is a driver of (also violent) conflict in contexts where the 'western' concept of property is not widely acknowledged. See, for instance, the literature on land grabbing, land privatization and biofuels/monoculture expansion in Latin Americam, Sub-Saharan Africa or Southeast Asia. Especially in the executive summary, the IPCC WGII should be very careful when dealing with property rights, since they can (dependent on how, by whom and in which context they are introduced/strenghtend) aggravate or reduce the risk for violent conflict. (Tobias Ide, Research Group Climate Change and Security)	Good point, this sixth ES summary point has been rewritten to reflect this and other comments.
140	66686	12	3	11	3	11	'per capita' should be in italics. (Peter Burt, University of Greenwich)	Amended



#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
141	58989	12	3	12	0	0	not clear why projecting property rights is singled out among all the functions that "robust institutional structures" must perform to minimize risk of conflict; moreover, adjustments in property rights arrangements are often an effective adaptation to resource stress (Ken Conca, American University)	Good point, this sixth ES summary point has been rewritten to reflect this and other comments.
142	60600	12	3	12	0	0	The text says that "democratic institutions" will reduce the risk that climate variability and extremes will lead to violence. While I sympathize with the proposition, I think it needs to be qualified in view of the evidence: Interstate conflict: Yes for pairs of democratic states, no for monadic data; internal wars: some evidence for longer term democracies, no for emerging democracies (Michael Brzoska, University of Hamburg)	Good point, this sixth ES summary point has been rewritten to reflect this and other comments.
143	60030	12	3	13	3	13	The statement that certain elements reduce the risk that climate variability and extremes lead to violence implies too direct a connection between climate change and violence, when it in fact exacerbates or multiplies other more direct factors leading to violence. (AUSTRALIA)	This sixth ES summary point has been rewritten.
144	66687	12	3	15	3	16	For consistency with other chapters, 'statistical' text in brackets should be in italics and not bold. (Peter Burt, University of Greenwich)	The word 'statistical' is not used in this ES point.
145	60557	12	3	16	0	0	why only medium evidence? (Vally Koubi, University of Bern)	The evidence is not large
146	56811	12	3	16	3	16	why only medium evidence? (Thomas Bernauer, ETH Zurich)	The evidence is not large
147	82551	12	3	16	3	16	In place of "modest," "medium" should be used for consistency with the uncertainties guidance for authors. (Katharine Mach, IPCC WGII TSU)	Text amended to reflect comment
148	66688	12	3	17	3	17	Delete comma after 'capital'. (Peter Burt, University of Greenwich)	Amended
149	62983	12	3	18	0	0	drives or exacerbates? (Helen Ross, The University of Queensland)	Thanks, word changed
150	73428	12	3	18	0	0	It is slightly misleading to say that conflict "drives" vulnerability to climate change impacts. Vulnerability is a combination of exposure, sensitivity and adaptive capacity - some or all of which may be undermined by conflict. For the sake of accuracy, change the sentence to read "...infer that conflict exacerbates vulnerability to climate change impacts". (UNITED STATES OF AMERICA)	Agreed, word changed
151	84631	12	3	18	3	18	The line of sight should be 12.5.3 rather than 12.5.2. (Michael Mastrandrea, IPCC WGII TSU)	Amended
152	62269	12	3	20	3	21	"Climate change will lead to new challenges to states and will shape both conditions of security and national security policies" Again there are not only states but also international organizations (including those in the security area, like OAS, OSCE, AU, Arab league and military alliances like NATO). There is no reference to "human" and "international security". This narrowing of security to national security policies is not representative of the global scientific debate that focuses significantly on international and human security. (see Brauch 2009; Scheffran et al. 2012a). (Hans Guenter Brauch, Free University of Berlin)	We discuss the geopolitical implications of climate change, which is clearly 'international' even if we do not use the word 'international'. We sought to balance national and international security dynamics in this section, and think the existing treatment meets this goal. The ES point has been rewritten.
153	84632	12	3	20	3	21	It would be worth considering mention of rate of change as well as magnitude of change here, as this is also discussed in section 12.6 (and 12.7). (Michael Mastrandrea, IPCC WGII TSU)	increasingly' is now used.
154	78007	12	3	20	3	28	Add to end of first sentence protection in place may not be possible because of lack of governance or financial mechanisms (Robin Bronen, University of Alaska)	This last ES summary point has been rewritten.
155	66689	12	3	21	3	21	For consistency with other chapters, 'statistical' text in brackets should be in italics and not bold. (Peter Burt, University of Greenwich)	The word 'statistical' is not used in this ES point.
156	66690	12	3	22	3	22	Delete commas after 'events' and 'water'. (Peter Burt, University of Greenwich)	Amended
157	84633	12	3	23	3	24	Section 12.5.4 is not directly relevant to this statement, but could support the statement on lines 26-27. 12.6.2 is more relevant to this statement. (Michael Mastrandrea, IPCC WGII TSU)	Amended
158	66691	12	3	24	3	24	Delete comma after 'States'. (Peter Burt, University of Greenwich)	Amended
159	62984	12	3	26	0	0	needs to include international institutions. (Helen Ross, The University of Queensland)	Institutions is inclusive of all scales.
160	82552	12	3	26	3	26	For this sentence beginning with "there is evidence," the chapter team should consider presenting calibrated uncertainty language within parentheses at the end of the sentence in place of the phrase or, alternatively, simply deleting the phrase and instead beginning the sentence with the text that follows. (Katharine Mach, IPCC WGII TSU)	This last ES summary point has been rewritten.
161	58990	12	3	27	0	0	This statement elides national security and human security. IF the point is that national-security dynamics will affect human security, that causal link should be clarified and unpacked (Ken Conca, American University)	This last ES summary point has been rewritten.
162	82553	12	3	31	0	0	Section 12.1. Given the visibility of the opening section, it should be tightened as much as possible in the preparation of the final draft of the chapter. (Katharine Mach, IPCC WGII TSU)	Much editing and clarification undertaken

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
163	58692	12	3	31	4	22	The subsection specifying the definition and scope of human security should come before the section on human security in previous reports. In other words, the order of subsections 12.1.1 and 12.1.2 should be reversed. (Joerg Friedrichs, University of Oxford)	Amended as in this suggestion
164	66692	12	3	36	3	36	Delete comma after 'culture'. (Peter Burt, University of Greenwich)	Amended
165	73429	12	3	36	3	39	In addition to WGIIAR4 calling for a systemic assessment of the relationship between climate change and human security in the next AR, the Social Development Department of the World Bank also made this request in their 2008 report "Implications of Climate Change for Armed Conflict", available at <a href="http://www-esd.worldbank.org/sdvpubs/index.cfm?Page=Search&amp;DocID=388&amp;sr=1">http://www-esd.worldbank.org/sdvpubs/index.cfm?Page=Search&amp;DocID=388&amp;sr=1</a> . This was one of six recommendations for future development and peacebuilding efforts: "Include security issues in the next round of IPCC assessments. In contrast to the natural science of climate change, the social implications lack solid research foundation and are dealt with by the IPCC only in scattered comments. If the security implications of climate change are to be taken seriously in the policy debate, the IPCC should take the lead in investigating them systematically.(page 3 of World Bank report). Suggest adding sentence that articulates the need for methods development in this field. (UNITED STATES OF AMERICA)	Thanks for the historical note. Research gaps now addressed in Box 12.2
166	66693	12	3	37	3	37	Capital 'C' required for 'chapter' (in this context it is a proper noun and is also in keeping with other usage in the document, eg line 38). (Peter Burt, University of Greenwich)	Amended
167	62270	12	3	43	0	0	Please check in the original whether chaoter 11 of WGII AR4 refers to national security. This chapter refers 23 times to security but only once to national security. This does not represent the security discussion in the chapter on Australia and New Zealand. (Hans Guenter Brauch, Free University of Berlin)	The scope of this chapyer is on human security, but we outline in Section 1 how that scope includes the impact of climate change on states and their ability to provide human security for their citizens. We have extensive cross-referral to chapters in AR5, but have also summarised at the start where the term is used in AR4.
168	66694	12	3	47	3	48	'et al.' should be in italics, and references should be in chronological order (and alphabetical order in the years). (Peter Burt, University of Greenwich)	Amended
169	73430	12	3	48	3	51	For clarity, revise this sentence to read "livelihoods; and the impact of context-specific realities across global regions are examined systematically in Chapters 11, 13" (UNITED STATES OF AMERICA)	Amended in line with this suggestion
170	73431	12	3	48	3	51	The specific dimensions of human security mentioned as being cross-referenced are mentioned, but not sufficiently explored or synthesized in terms of their impact on human security. (UNITED STATES OF AMERICA)	Edited Section 2 now addresses this point
171	66695	12	3	50	3	50	Capital 'C' required for 'chapter' (in this context it is a proper noun and is also in keeping with other usage in the document). (Peter Burt, University of Greenwich)	Amended
172	61272	12	4	3	4	9	Reference for this first paragraph would be good. What is this definition of human security based on? It incorporates well-being dimensions in the concept. Perhaps it would be useful to highlight what dimensions are including in the concept of human security. I think expanding the definition a little and making it clear what is considered under this concept would be useful as the reader goes on to the rest of the report. (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	Wish to keep the definition absolutely clear and this has been worked out across the team and reflecting the literature. The subsequent paragraph gives the sources and explains the origins and controversies.
173	73432	12	4	4	4	5	"vital core" is not clear and could use further definition or alternative language. (UNITED STATES OF AMERICA)	Standard language of human security. Vital core is defined in the subsequent sentence.
174	58988	12	4	4	4	9	This definition of "human security" is highly political. Besides, "dignity" can not be defined independently of the spatiotemporal context. The sentence "poverty, discrimination of many kinds, and extreme natural and technological disasters undermine human security" is 1°) political, 2°) parochial — discriminations are at the core of many cultures of the 500 million indigenous people referred to same chapter, 9:14, see also 10:18-19 (Defining culture as "a cumulative body of knowledge, pratice and belief".) — and 3°) conceptually arbitrary (the link between discrimination and human security is highly problematic in itself). In this context, recommended measures to fight "discrimination" and promote "human security" are oxymoronic. (Driue Godefridi, Cogito )	The definition reflects standard discussions in human security literature and the causes of insecurity are well established in evidence. The definition is not highly political, but rather has diverse meanings and interpretations in different intellectual traditions

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
175	77496	12	4	4	4	9	The concept of human security is underdefined and imprecise in this chapter. Because the concept is poorly specified, the subsequent organization of the chapter is a little odd. It's hard to distinguish human security from livelihoods the way the concept is defined in this chapter. The argument focuses on human security as occurring when "the vital core" of human lives is protected. It would seem that what would follow from that would be an exploration of the circumstances under which climate change could directly or indirectly threaten the "vital core" of human lives. The most important aspect of the vital core would have to be survival. Thus, an assessment or reference of the circumstances under which climate change could expose people to hazards that could kill people would be a logical point of departure. Instead, the chapter begins with a discussion of livelihoods, gender, adaptation and livelihoods, culture, indigenous peoples, traditional knowledge. (Busby Joshua, University of Texas-Austin)	This is a well-made point. The agreed definition reflects the wider literature on the subject, while the sub-sections of the chapter reflect the plenary agreed outline of the WG2. Nevertheless the chapter does address vital core issues, not least in the issues of basic needs livelihoods and the impact of conflict where survival is key. Newer version picks up the definition of vital core in concluding section
176	77497	12	4	4	4	9	While some of these (gender, indigenous peoples) could be categories of groups especially vulnerable to death from exposure to climate-related hazards, the discussion in the first part of this chapter is fairly nebulous focusing on things less centrally important than whether or not large numbers of people might die. Focusing on the direct ways that climate hazards could kill people and affect individual human security would imply a much more robust discussion of extreme weather events and the conditions under which extreme climate hazard exposure leads to mass death. On this point, the disaster vulnerability literature, the SREX report would and should be more referenced more throughout. From here, one could then discuss the various pathways that might lead from climate change (or responses to climate change) and impacts on human security (with an emphasis first and foremost on threats to individual human lives). This emphasis on threats to human lives would intersect and follow from the previous chapter on human health but might have a less disease-specific emphasis. Chapter 11 also has less on extreme weather events than I would have expected. While Chapter 11 does have some elements on the social determinants of vulnerability, governance considerations are less central to that analysis. Thinking through the set of circumstances when large numbers of people may die as a result of exposure to climate-related hazards is discussed for example in the UNISDR reports. P. Peduzzi et al., "Assessing Global Exposure and Vulnerability Towards Natural Hazards: The Disaster Risk Index," Nat. Hazards Earth Syst. Sci. 9, no. 4 (July 17, 2009): 1149–1159, doi:10.5194/nhess-9-1149-2009; Peduzzi et al., The Global Risk Analysis for the 2009 Global Assessment Report on Disaster Risk Reduction (Davos, Switzerland: International Disaster and Risk Conference, 2010), <a href="http://www-fourier.ujf-grenoble.fr/~mouton/Publis_HDR_applis/Peduzzi-The_Global_Risk_Analysis_for_the_2009_GAR-149.pdf">http://www-fourier.ujf-grenoble.fr/~mouton/Publis_HDR_applis/Peduzzi-The_Global_Risk_Analysis_for_the_2009_GAR-149.pdf</a> . See also Joshua W. Busby et al., "Climate Change and Insecurity: Mapping Vulnerability in Africa," International Security 37, no. 4 (2013). (Busby Joshua, University of Texas-Austin)	Good point. We include the risk of death in the definition and refer to this literature in Section 2
177	61273	12	4	7	4	8	The juxtaposition of the many processes that influence human security (markets, the state and civil society) with negative processes (such as poverty, discrimination and extreme natural disasters for example) implies that they are wholly positive. This is not always the case and the section should be reworded to reflect this ambiguity. (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	The state market and civil society determine human security in both positive and negative manner. No change to the agreed definition made.
178	66696	12	4	8	4	8	Delete comma after 'kinds'. (Peter Burt, University of Greenwich)	Amended
179	66697	12	4	15	4	15	Change 'regional' to 'region'. (Peter Burt, University of Greenwich)	Amended
180	69150	12	4	15	4	15	The word "regional" should be changed with "region" (NETHERLANDS)	Amended
181	73433	12	4	21	4	21	We suggest that the authors add a core dimension of "fragility", which is different than conflict but equally relevant to climate change related vulnerability of states and communities. (UNITED STATES OF AMERICA)	This is a list of the major search terms - we also used related terms and synonyms in those searches. So no change made to the sense of this sentence.
182	61274	12	4	21	4	22	Why have these terms been selected for the systematic search? Related to some of the dimensions of human security? How are these terms related to the elements of human security in the conceptual figure 12-3? (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	These terms cover the main issues of the chapter - cultural dimensions, migration, conflict etc. that are part of plenary agreed outline terms of reference for the chapter.

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
183	69151	12	4	28	4	28	The chapter does not properly introduce the concept of human right and uses the term in general common-sense. For such a scholarly review it is important to be very clear on this definition. Are the authors endorsing the 1972 Stockholm Declaration of the United Nations Conference on the Human Environment. Principle 1: "Man has the fundamental right to freedom, equality and adequate conditions of life, in an environment of a quality that permits a life of dignity and well-being". Some authors have argued that we need to revise our concepts of human rights by for instance including 'human right to health' that could include a stable climate. See (Caney 2010); already on the list of references. The concept of human rights is a key concept when discussing human security. This is not sufficiently reflected in the chapter. (NETHERLANDS)	The chapter, as explained in the box, is not framed in terms of human rights, which is one specific way to frame human security. The chapter adopts a pragmatic approach as to what constitutes human security, as discussed in the definition sentences. The box on human rights is included to demonstrate that there are alternative ways to frame the issue but that human security and human rights are not synonymous.
184	69152	12	4	28	4	28	Another issue insufficiently discussed in the chapter is the temporal aspect of human security. There is a large body of literature emphasizing this aspect. It is important to note that it is more commonly referred to as 'safety' in these literature, but according to the definition of the chapter (page 4, line 4) this is exactly what has been discussed in these papers and book with respect to the security of future generations. See for instance this book as key literature on this issue: Gardiner, S. 2011. A Perfect Moral Storm: The Ethical Tragedy of Climate Change. New York: Oxford University Press. (NETHERLANDS)	Good point. This issue of long-term nature of human security is picked up in Box 12.2 (on research needs) and in the conclusion of the chapter about the potential for high impact world meaning analysis of marginal change in human security might be understating the problem.
185	59004	12	4	28	4	33	Given the lack of clarity and disciplinary differences as to what 'human security' refers to, it would be useful to have a clearer definition of how human security is defined in this chapter. The predominant focus appears to be migration and conflict (and, for example, there is less of a focus on health/housing/financial markets etc) (Celia McMichael, La Trobe University)	Clarification of the definition undertaken. The scope of the chapter, including national security scattered throughout Section 1, so have tried to clarify that.
186	73434	12	4	28	4	37	This discussion is quite abstract. The authors should consider adding an example of a specific case showing how climate change can put human rights at risk. Similarly, based on the last paragraph in the text box, it would be useful to the reader to see an example of how victims of human rights violations are also more vulnerable to climate change impacts. (UNITED STATES OF AMERICA)	Box edited for clarity. Point of the box is to show human rights is an alternative framing
187	62985	12	4	30	0	0	Statement here seems to omit food and water security, as dimensions of human security and also closely allied with human rights. These seem to me very important, but may or may not belong right here. I am thinking of the survival tier of Maslow's hierarchy of needs. (Helen Ross, The University of Queensland)	Box edited for clarity. Point of the box is to show human rights is an alternative framing
188	62987	12	4	34	0	0	note some interest in the impacts of climate change on those with disabilities. I am aware of this from practitioners, I am not sure where it is published, if it is. (Helen Ross, The University of Queensland)	Not found in literature searches. Perhaps it will be published on in the future.
189	80091	12	4	35	4	32	The victims of human rights violations are also vulnerable to climate change...." Change into "....may also be...." ? E.g. are homosexuals in Europe more vulnerable to CC than.... (Mikko Halonen, Gaia Consulting Oy)	Major point here is the vital core of basic needs and shelter and ability to live in dignity represents security. When those are absent, such as in countries in conflict, it is very difficult to deal with climate change impacts manifest through extremes. Sentences amended
190	69153	12	4	35	4	37	Barnett, 2009 does not exist in the list of references (NETHERLANDS)	References fixed
191	73435	12	4	35	4	37	The concluding two lines of this box are pretty bold and do not appear to be strongly supported by the literature (i.e., one reference). The authors should consider retaining lines 28-33 of the box, but deleting lines 35-37. (UNITED STATES OF AMERICA)	Sentences amended
192	73436	12	4	37	5	37	Perhaps the best effort to relate natural resources, environmental change, and security is found in the UNEP report of 2009, From Conflict to Peace Building, and it should be an included reference: "Since 1990, at least 18 violent conflicts have been fueled by the exploitation of natural resources. Looking back over the past 60 years, at least 40% of all intrastate conflicts can be associated with natural resources." (UNITED STATES OF AMERICA)	This literature covered in Section 5
193	80092	12	4	41	4	41	"This chapter...." Which chapter ? , are there several chapters here (within this chapter?) => consider e.g. referring clearly to chapter and different sections in this chapter (Mikko Halonen, Gaia Consulting Oy)	Amended
194	61275	12	4	41	4	42	The sentence states that 'This Chapter assesses research on how climate change may exacerbate these and other threats to human security and how these factors restrict the ability to adapt to climate change' What is meant by 'these and other threats' and 'how these factors restrict...'. This needs rewording to clarify what is being referred to. (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	Sentence amended to reflect comment
195	80093	12	4	41	4	42	" these..." What does "these refer to ? Please clarify (Mikko Halonen, Gaia Consulting Oy)	Sentence amended to be more specific

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
196	82554	12	4	41	4	42	On line 41, it is not clear what "these" refers to. Similarly, it is not clear what "these factors" refers to on line 42. (Katharine Mach, IPCC WGII TSU)	Sentence amended to be more specific
197	84634	12	4	41	4	42	It is not clear what "these" refers to in both lines. (Michael Mastrandrea, IPCC WGII TSU)	Sentence amended to be more specific
198	62986	12	4	44	0	0	ditto (NOTE: Pasted here for your convenience) Statement here seems to omit food and water security, as dimensions of human security and also closely allied with human rights. These seem to me very important, but may or may not belong right here. I am thinking of the survival tier of Maslow's hierarchy of needs. (Helen Ross, The University of Queensland)	Amended - the definition of human security and discussion in Section 1 now clarifies these relationships.
199	73437	12	4	44	4	46	"Low health status" is identified as an underlying process that affects the capacity of individuals and groups to adapt to climate change. Indeed, public health is both a predisposing factor to and a consequence of inadequate adaptation to climate change. The sentence ended on line 46 with the word including, however, there were no further examples or explanation given. Provide additional examples, such as disease or famine, added to this sentence? (UNITED STATES OF AMERICA)	These sentences deleted as was repetitive
200	66698	12	4	45	4	45	Very cumbersome sentence. Delete comma after 'poverty'. (Peter Burt, University of Greenwich)	Sentence were deleted
201	58991	12	4	46	0	0	incomplete sentence (Ken Conca, American University)	Sentence deleted
202	73438	12	4	46	0	0	Something appears to be missing after the word "including". (UNITED STATES OF AMERICA)	Deleted sentence in rewrite
203	63276	12	4	46	4	46	Delete word "including" (Christian Webersik, University of Agder)	Sentence deleted
204	80094	12	4	46	4	46	"including" Referring to what ? (Mikko Halonen, Gaia Consulting Oy)	Deleted sentence in rewrite
205	82555	12	4	46	4	46	This sentence should be clarified (perhaps this is simply a typo). (Katharine Mach, IPCC WGII TSU)	Deleted sentence in rewrite
206	73439	12	4	47	4	50	The chapter reflects correctly that the literature to date has focused more heavily on identifying the negative correlations between climate change and human security but is it fair to suggest that may be a weakness of the research approach rather than a reflection of the lack of potential, even if small or limited, for climate change to influence human security in positive ways in some specific locations (e.g. improved agricultural yields in areas receiving more rain) or to serve as an entry point for peacebuilding through conflict sensitive climate change interventions in conflict-prone or fragile states? This may be a minority of cases but the authors should raise this point, or we miss the opportunity to harness resiliency rather than vulnerability. (UNITED STATES OF AMERICA)	The team discussed the balance of the positive and negative impacts on climate change. While there may be some biological or physical benefits of specific crop yields in specific places with specific temporary or permanent changes in a weather parameter such as more rainfall, the overall assessment of the literature is that the impacts on human security through the linkages identified are mainly negative. The point about the need to build resilience is well made, and incorporated in discussions about migration as adaptation and the need for mobility, as well as in the sections on peace building
207	69154	12	4	48	4	50	The sentence which starts with "But the literature..." needs a reference since the way it stands now seems to be distant from having a sound standing and looks more like a speculation. It should be explicit that what is meant by "some elements of human security" (NETHERLANDS)	Deleted sentence in rewrite
208	73440	12	4	48	4	50	This last sentence is important and should be highlighted more prominently-- while we know that climate change is occurring all over the world, we also know that human security is not threatened all over the world, which demonstrates that other drivers are work. (UNITED STATES OF AMERICA)	Elements of human security, including cultural dimensions, are universal and experienced everywhere. But the distribution of insecurity is skewed.
209	60398	12	5	9	5	37	Box 12-2. This section could perhaps provide deeper insight into the limitations (in terms of causal pathways) that the general availability of relevant data pose. If appropriate, insight could be given into how our understanding may improve in the future with the increased data collection. In the context of migration, reference could be made to a paper by Bilsborrow & Henry (2012). Citation - Bilsborrow, R.E., S.J.F. Henry, 2012: The use of survey data to study migration-environment relationships in developing countries: alternative approaches to data collection. Popul Environ, 34 pp113-141. (Christopher Smith, United Nations University)	We have added a paragraph at the end of this box outlining data gaps and research needs.
210	59005	12	5	10	0	0	Consider rewording the statement that evidence on human security/climate change is not 'coherent'. This could be misinterpreted as implying it doesn't make sense or isn't expressed clearly (i.e. it is incoherent). (Celia McMichael, La Trobe University)	Sentence rewritten.
211	58992	12	5	15	0	0	It would be more accurate to say that these different approaches strengthen the robustness of conclusions WHEN THEY CONVERGE on similar findings. (Ken Conca, American University)	Sentence changed accordingly

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
212	65526	12	5	18	5	20	References are needed on these empirical studies bringing evidence. The following are only some examples: 1. Foresight (2011). Migration and Global Environmental Change: Final Project Report. London: Government Office for Science. 2. Jaeger, J., Fruehmann, J., Gruenberger, S. and Vag, A. (2009) Environmental Change and Forced Migration Scenarios (EACH-FOR), Synthesis report, EACH-FOR, Budapest. 3. Warner, K. & T. Afifi (2013) Where the rain falls: Evidence from 8 countries on the circumstances under which households use migration to manage the risk of rainfall variability and food insecurity, Climate and Development (Tamer Afifi, United Nations University Institute for Environment and Human Security)	The box is characterising the evidence, the references to the studies that provide evidence are throughout the chapter (there are hundreds of them). In any event this para has been deleted.
213	73441	12	5	18	5	20	This short paragraph does not seem necessary to me. The idea presented here has been more or less presented in the previous paragraph. The authors should consider deleting it. (UNITED STATES OF AMERICA)	Agree, it has been deleted
214	80213	12	5	18	5	20	References are needed on these empirical studies bringing evidence. In general Etienne Piguet (U. Neuchatel with IOM, 2012) did a bibliography on climate change and human mobility which has easily organized literature. You may also consider citing any of the Rainfalls case studies which were released in 2012 and which will be published in a special journal edition of Climate and Development in Autumn 2013 (submitted by the IPCC cutoff deadline of 31 Jan 2013). the reference to the journal is: Afifi, T. and Warner, K. (guest editors). Empirical evidence and new analytical framework for understanding the relationship between rainfall variability, food and livelihood security and human mobility. Climate and Development. 2013. (Koko Warner, United Nations University - Institute for Environment and Human Security)	The box is characterising the evidence, the references to the studies that provide evidence are throughout the chapter (there are hundreds of them). In any event this paragraph has been deleted.
215	61276	12	5	19	0	0	The term anthropogenic climate change is used here. Seems to be the only place in the chapter. Is it important to make this distinction here? (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	This paragraph has been deleted.
216	66676	12	5	25	5	44	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
217	59006	12	5	29	5	31	I think these sentences about correlation and causality are a bit ambiguous. While associations are not necessarily causal, correlations generally are a measure of a (linear) causal relationship between variables. I think it is useful to clarify what is meant by the statement that 'correlations alone do not explain causality' - do you mean they can be confounded by other variables? or that in cross-sectional research it different to attribute causal connections? (Celia McMichael, La Trobe University)	This paragraph has been re-written to be more specific and to highlight that whilst correlations do not explain causality, they are important in testing theories.
218	73442	12	5	29	5	31	These statements/assertions about correlation and causality need to be carefully addressed in light of how they are used in the rest of the report. The authors should remove the last sentence (lines 30-31) as it can be misused and misinterpreted. The previous two sentences provide sufficient context for how any findings on these issues should be interpreted. (UNITED STATES OF AMERICA)	The sentences have been rewritten.
219	56812	12	5	30	5	30	I would drop the last sentence here or remove the paragraph entirely... In its present form, it simply tells the reader that one cannot infer anything from quantitative studies (Thomas Bernauer, ETH Zurich)	Sentence has been revised
220	82556	12	5	34	5	35	What is meant by "the effects" could be clarified--the specific effects, specific projections, etc.?? (Katharine Mach, IPCC WGII TSU)	Changed to 'influence'
221	73443	12	5	34	5	36	There appears to be a contradiction between lines 34-35 and line 36. The authors need to clarify what is meant by these lines. (UNITED STATES OF AMERICA)	Wording has been changed to reflect the distinction.
222	60558	12	5	35	5	36	It seems that the statement that there exists robust evidence about many of the links between climate change and human security, contradicts the general assessment presented in the executive summary, where medium evidence is reported for most of the links. (Vally Koubi, University of Bern)	Wording has been changed to reflect the distinction.
223	61277	12	5	46	5	50	Add a reference to section 12.6 and use the term national security to a link in to that section instead of talking about state? (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	Signposting throughout the chapter improved to address this specific issue

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
224	73444	12	5	46	5	50	This paragraph is somewhat problematic. The last part of the first sentence, "...thus creating risks to national security through migration and violent conflicts" is really not an accurate reflection of the subsequent discussion. That discussion makes it clear that research has been mixed about whether reduced human insecurity really does lead to violent conflict (or other threats to national security). There is a lot of nuance at play here. One solution would be to replace the problematic phrase above with "...thus creating circumstances in which there is greater potential for violent conflict, especially in the absence of institutions that manage property rights and resolve conflicts effectively." (UNITED STATES OF AMERICA)	Good point - the nuance suggested has been adopted.
225	62988	12	5	47	0	0	tautology (increased...may rise...) (Helen Ross, The University of Queensland)	Amended through response to Comment 224
226	80095	12	5	48	4	50	clarify sentences or remove (Mikko Halonen, Gaia Consulting Oy)	Amended through response to Comment 224
227	63269	12	5	49	5	49	"this chapter" should read "this Chapter" (Christian Webersik, University of Agder)	Amended through response to Comment 224
228	73445	12	5	52	5	52	The authors should consider deleting "the framing of" and restate the first sentence as: "Climate change as a security issue has been the subject of much debate." (UNITED STATES OF AMERICA)	Sentence amended for clarity (though not these words)
229	61278	12	5	52	5	54	Refocusing the implications of climate change for human security, centred on people's well-being rather than taking a national security view which misses how different individuals and communities may be affected. (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	This captures the sense of the paragraph
230	73446	12	5	54	0	0	The authors should consider adding "or the most capable institutions (formal or informal)" at the end of the sentence. (UNITED STATES OF AMERICA)	Implicit in text as it stands
231	73447	12	5	54	0	0	There is a missing term after "vulnerable"; the authors should consider inserting "human populations." (UNITED STATES OF AMERICA)	Good suggestion - amended
232	66699	12	5	54	6	1	References should be in chronological order (and alphabetical order in the years). (Peter Burt, University of Greenwich)	Amended
233	56838	12	6	0	6	5	This 'broad approach' to human security is not clear. What are the different approaches to human security that are available? Which approaches have been excluded here - and why? This should be explicit. And why has this broad approach been chosen? (Tor A. Benjaminsen, Norwegian University of Life Sciences)	The broad approach refers to the pragmatic approach of adopting definitions of human security in the literature and applying those to the specific areas of cultural impacts, migration, conflict and the relationship to national security that are the main issues in the plenary agreed outline. Wording amended to reflect this point.
234	73448	12	6	1	6	3	The sentence states that "some countries are concerned about the security risks posed by climate change and the effects on relations between states." In The Global Security Defense Index on Climate Change: Preliminary Results "National Security Perspectives on Climate Change from Around the World" (released March 2013) at least 110 nations have identified climate change as a threat to their security with many integrating climate change into their defense and national security planning documents. Suggest strengthening this sentence and citing the report, available at: <a href="http://americansecurityproject.org/ASP%20Reports/Ref%200121%20-%20Global%20Security%20Defense%20Index%20P-Results.pdf">http://americansecurityproject.org/ASP%20Reports/Ref%200121%20-%20Global%20Security%20Defense%20Index%20P-Results.pdf</a> . (UNITED STATES OF AMERICA)	Not included - grey literature, though the sense of the point remains in the text
235	61279	12	6	4	6	4	Following comment on p.2, l.22-23, the approach taken needs to be set out. This sentence also does not flow from the previous one which relates to between state conflicts whereas the definition used at the start of 12.1.2 is person-centred. (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	The comprehensive and inclusive approach in the chapter necessitates consideration of the national security dimensions as states play a central role in providing human security. Now justified fully in Section 1
236	77498	12	6	5	6	6	The line suggests that a broad definition of human security is widely supported in the literature. The chapter overstates the degree of agreement among academics that human security is a useful concept. While citing Roland Paris's work, the chapter fails to note his worries that human security may be too nebulous a concept and undermine the broader traditional understanding of security. Roland Paris, "Still an Inscrutable Concept," Security Dialogue 35, no. 3 (2004): 370-372. Busby 2008 also provides a discussion of climate change and human security and how a refined definition of national security is a more precise security concept to use as a basis of analysis. Joshua Busby, "Who Cares About the Weather? Climate Change and U.S. National Security," Security Studies 17, no. 3 (2008): 468-504. The chapter could benefit from a more extended discussion about what distinguishes "human security" from "national security" and how the emphasis on human security can be distinguished from a livelihoods analysis. (Busby Joshua, University of Texas-Austin)	Space precludes a longer discussion about the relationship - we adopt a pragmatic approach that national security is important because it affects the ability of states to provide the circumstances for human security. The specific role of states is elaborated further in Section 6.

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
237	77499	12	6	5	6	6	The emphasis on whatever threatens the vital core of human existence means that different people study different aspects of threats to the vital core -- livelihoods for some, culture for others, mobility, violence for still others. This makes the chapter something of a mishmash of potential bad things that happen to human beings as a result of climate change. It should be acknowledged that most of the literature on "security" in this space focuses on a narrow piece on whether or not climate change will contribute to violent conflict. While I agree that narrow focus may have its defects, the approach taken here doesn't acknowledge or engage with that debate and by virtue of the organization, omits key aspects of threats to human security (namely survival) and puts violence, the issue most identified with security, at the back of the chapter, implying less critical importance (?). In any event, if the structure remains as it is, there should be a clear logic for why the chapter starts with the discussion it does. (Busby Joshua, University of Texas-Austin)	The comprehensive and inclusive approach of the chapter means we need to examine all the specific issues. The point raised about omitting the issue of mortality and survival is well made and is incorporated in Section 2.
238	58693	12	6	8	7	30	The problem with this section is obviously the high overlap with Chapter 13 on livelihoods. It's entitled "Economic and livelihood dimensions...", but I'd suggest deleting the first couple of words. The section really is about livelihood dimensions, whereas economic aspects are covered in Chapter 10. I guess the natural logical flow would be for the report to first have a chapter on the economic implications of climate change, then on the livelihood implications, and then on the human security implications (which could then refer back rather than forward to the chapter on the livelihood implications). In short, the order of Chapters 12 and 13 should perhaps be reversed. (Joerg Friedrichs, University of Oxford)	The order of chapter sequencing cannot be changed by authors.
239	58994	12	6	8	7	30	Weak section. The two paths identified (exposure to shocks, and migration) miss important mechanisms, including access to productive resources, the costly need to hedge against greater uncertainty, and the marginalizing consequences of increased resource competition (Ken Conca, American University)	Point taken and attempts at addressing these issues made through the rewrite.
240	61280	12	6	8	7	30	We appreciate the effort in 12.2.1 to caution against mitigation and adaptation strategies that can advance or undermine human insecurity. However, this loaded assertion needs careful unpacking, including in the ways mitigation and adaptation themselves could, when at odds, negatively interact and thereby exacerbate human insecurity. The cursory statement, for example, in 12.2.2 that "some adaptation interventions in specific circumstances can decrease human security" prompts the question: isn't this maladaptation rather than indicative of a purported link with human security? We also find a similar weakness in the brief but loaded assertion in 12.5.2 that "climate change adaptation in Kenya has the capacity to aggravate surrounding conflicts" (without any explanation). (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	This statement is taken on board. A more balanced treatment is now attempted.
241	80206	12	6	10	6	31	12.2.1 Could reference recent case studies on loss and damage (and relation to human security such as impacts on material aspects of livelihood security, evidence). Kusters, K. & N. Wangdi (2013). The costs of adaptation: Changes in water availability and farmers' responses in Punakha district, Bhutan. Int. J Global Warming, Vol. X, No. x, pp. xx-xx; Monnereau, I. & S. Abraham (2013). Limits to autonomous adaptation in response to coastal erosion in Kosrae, Micronesia. Int. J Global Warming, Vol. X, No. x, pp. xx-xx. (Koko Warner, United Nations University - Institute for Environment and Human Security)	Thanks for the new references. They are not published and miss the eligibility criteria. If they provide contrary evidence they could be used in the next assessment report.
242	80096	12	6	14	6	15	"... five capital assets..." Suggest to remove five and replace e.g. with various Not all research necessarily group them accordingly and always refer to specifically these five (cultural? – also noted in the figures/tables of the chapter) (Mikko Halonen, Gaia Consulting Oy)	Agreed and removed this reference to capital.
243	62989	12	6	15	0	0	Does this need a reference: I recommend Flora, C.B., Flora, J.L., & Fey, S. (2004). Rural communities: Legacy and change (2nd ed.). Colorado: Westview Press. (Helen Ross, The University of Queensland)	This has been addressed in a rewrite. Need for reference not required.
244	66700	12	6	15	0	15	Reference required. (Peter Burt, University of Greenwich)	This has been addressed in a rewrite. Need for reference not required.
245	64914	12	6	16	6	20	reference to Box 18-4 on Local and Indigenous Knowledge but box 18-4 is acutally on "differences in Detection and Attribution of Ecosystem Change on Land and in the Ocean" - the correct reference should be to Box 18-5 "Detection, Attribution and Traditional Ecological Knowledge (TEK) (Ameyali Ramos Castillo, United Nations University - Institute of Advanced Studies)	Amended and rewritten and changed.
246	66701	12	6	20	6	20	I don't think 'cognate' is the correct word to use here: I suspect you mean 'other'. (Peter Burt, University of Greenwich)	Sentence reworded in re-write



#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
247	61281	12	6	20	6	21	What kind of climate change impacts is this referring to? Is it climate change in general, both long-term gradual changes as well as extreme weather events? The paragraph seems to be focusing more on extreme weather episodes such as storms and floods. If so then it would help to make this explicit as long term changes in climate on natural resources could also be argued to in some cases benefit livelihoods (e.g. increased productivity, less reliance on irrigation due to rainfall) (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	Addressed in re-write and made clear that impacts do not just relate to extreme weather events.
248	61282	12	6	20	6	23	Consider including reference to the psychological impacts of climate shocks in this section. The psychological impacts of extreme and traumatic events are documented. Additionally worry and concern about potential impacts also affects human security See for example Doherty and Clayton 2011; American Psychologist; May-Jun; 66(4): 265-76. doi: (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	Reference to point being made about psychological impacts captured as well as reference.
249	62271	12	6	21	0	0	There is no definition of the concept of livelihood security that was used intensively in South Asia, see. E.g. Bohle, Hans-Georg, 2009: "Sustainable Livelihood Security. Evolution and Application", in: Brauch, H.G. et al.(Eds.): Facing Global Environmental Change: Environmental, Human, Energy, Food, Health and Water Security (Berline et al.: Springer-Verlag): 521-528. (Hans Guenter Brauch, Free University of Berlin)	Included the word 'sustainable' livelihoods and also the reference to Bohle as suggested.
250	73449	12	6	24	6	31	This second point did not seem to follow from the main idea, which was that there were two ways that climate change influences livelihood security. This second point focuses more on how climate change prompts adaptation strategies, but the point never circles back and connects to livelihood security. Perhaps this can be done by taking the example described on page 7 (lines 27-30) and integrating this into this discussion. (UNITED STATES OF AMERICA)	Paragraph has been re-organised in re-write
251	58993	12	6	37	6	46	One of the key insights of the literature on gender and natural resources is that women are key gatekeepers of common-property resources but tend to lack access when resoures are marketized. The risks that climate changne poses to women's access to open-access or common-property resources should be noted (Ken Conca, American University)	These gender issues now discussed in depth in the cross-chapter box on gender and vulnerability and referred to in Section 2.
252	61283	12	6	37	6	46	The responses and capacity to adapt are also gendered. Women are not just vulnerable to climate change as emphasised here but can also act as agents of change and enhance resilience to climatic events if they are responsible for the well-being of the household. Womens cooperatives and organisations can be very effective, examples can be found on the coast in Peru in fishing communities when faced with El Nino events. (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	These gender issues now discussed in depth in the cross-chapter box on gender and vulnerability and referred to in Section 2.
253	62272	12	6	37	6	46	The concept of dual vulnerability covers well the interlinkage between environmental and social vulnerability, see e.g. Bohle, Hans-Georg, 2001: "Vulnerability and Criticality: Perspectives from Social Geography", in: IHDP Update, 2/01: 3-5; at: < <a href="http://www.ihdp.uni-bonn.de/html/publi-cations/update/IHDPUpdate01_02.html">http://www.ihdp.uni-bonn.de/html/publi-cations/update/IHDPUpdate01_02.html</a> >. (Hans Guenter Brauch, Free University of Berlin)	Included the reference to the book chapter by same author above, a recent reference (2009). Did not include this reference, an old reference 2001.
254	62273	12	6	37	6	46	see on the gender dimension of human insecurity, e.g. ThanhDam Truong, Des Gapter, Jeff Handmaker, Sylvia I. Bergh, (Eds.): Migration, Gender and Social Justice – Perspectives on Human Insecurity (Heidelberg – Dordrecht – London – New York: Springer, 2013). (Hans Guenter Brauch, Free University of Berlin)	These gender issues now discussed in depth in the cross-chapter box on gender and vulnerability and referred to in Section 2.
255	73450	12	6	37	6	46	Women in food security: The role of women in producing food (in developing countries 60 to 80% of of food is produced by women) could be enhanced by available data in chapter 12. (Place such data between lines 37 and 46 on page 6 under.12.2.1 Impacts on Material Aspects of Livelihood Security). (UNITED STATES OF AMERICA)	These gender issues now discussed in depth in the cross-chapter box on gender and vulnerability and referred to in Section 2.
256	66703	12	6	38	6	38	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
257	61284	12	6	39	6	42	See also Neumayer, E., and Plumper, T (2007) The Gendered Nature of Natural Disasters: The Impact of Catastrophic Events on the Gender Gap in Life Expectancy, 1981–2002 in Annals of the Association of American Geographers, 97(3), 2007, pp. 551–566. for further evidence of the impact of gender on mortality from extreme events (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	This specific reference referred to in cross-chapter gender box
258	63283	12	6	42	6	43	There is evidence that women are more vulnerable to natural disasters than men affecting women's mortality rates. In other words, disasters kill more women than men. Neumayer, Eric and Thomas Plümper. 2008. "The Gendered Nature of Natural Disasters: The Impact of Catastrophic Events on the Gender Gap in Life Expectancy, 1981-2002." Annals of the Association of American Geographers 97(3):551-566. (Christian Webersik, University of Agder)	This reference and its fiundings referred to in the gender cross-chapter box

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
259	78236	12	6	43	0	0	The loss of family livelihoods due to expanding gully activities in south eastern Nigeria and consequent school drop-outs (especially girls owing to local cultural alignment) has resulted to known cases of robbery, prostitution and other social vices (Ezenekwe, 2009). [Ezenekwe Elochukwu. Investigation into Climate Change Contribution to the worsening gully/landslide activities in Anambra state of south eastern Nigeria (case study: Nanka community). Report for the Zeeler Campaign Initiative of Peace Advocacy and Sustainable Development Outreach, PASDO, 2009] (Elochukwu Ezenekwe, Nnamdi Azikiwe University )	Grey literature referenee not taken up. Cross-chapter gendwer box discusses these issues.
260	63274	12	6	43	6	43	Delete space between hazards and fullstop (Christian Webersik, University of Agder)	Gender box removed after discussion with team and replaced with Box on food prices.
261	66704	12	6	43	6	43	Delete space after 'hazards'. (Peter Burt, University of Greenwich)	Gender box removed after discussion with team and replaced with Box on food prices.
262	66702	12	6	54	6	54	References should be in chronological order (and alphabetical order in the years). (Peter Burt, University of Greenwich)	Addressed in rewrite
263	61285	12	6	54	7	2	Climate variability can also result in sub-optimal decisions as resource dependent communities to seek to actively manage and reduce risk and exposure to climate variability and extreme events. This could result in planting crops that do provide a satisfactory rate of return or selling goods and services at markets at below optimal value (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	Attempted to capture in broader discussion on benefits of adaptation and losses, section 12.2.2.
264	58694	12	7	2	7	6	I vsmmpy see how these health and education impacts are related to livelihood. They are of course somewhat connected, but you should either explicitly show these linkages, or transfer this to somewhere else. (Joerg Friedrichs, University of Oxford)	The health and education impacts are critical for the vital core dimensions of human security. The text has been amended to clarify.
265	66705	12	7	4	7	4	'et al.' should be in italics (Peter Burt, University of Greenwich)	Amended
266	66706	12	7	6	7	6	'et al' should be in italics, with a full stop after the 'l' and a comma before the date. (Peter Burt, University of Greenwich)	Amended
267	66707	12	7	6	7	6	References should be in chronological order (and alphabetical order in the years). (Peter Burt, University of Greenwich)	Amended
268	66708	12	7	21	7	23	References should be in chronological order (and alphabetical order in the years). (Peter Burt, University of Greenwich)	Amended
269	66709	12	7	21	7	24	'et al.' should be in italics (Peter Burt, University of Greenwich)	Amended
270	80214	12	7	22	7	23	It could be added to point 2) that migration is used as a risk management strategy by farmers in rain-fed areas (Rainfalls) (Koko Warner, United Nations University - Institute for Environment and Human Security)	Addressed with reference to Galvin study. Point also made that climate variability not the only migration inducing stress factor.
271	69155	12	7	23	7	24	Insurance should be approached critically as an adaptation intervention since it is a market-based tool with potential shortcomings in providing coverage for the most vulnerable. For example see Linneroth-Bayer and Vari (2008) Extreme Weather and Burden Sharing in Hungary, in (eds.) Adger, Paavola, Huq and Mace, Fairness in Adaptation to Climate Change, MIT Press. (NETHERLANDS)	Included the caveats to insurance in the sentence and also included the reference as suggested.
272	82557	12	7	27	7	27	In place of "emerging evidence," or in addition to the phrase, the chapter team could consider using summary terms for evidence (and agreement) to communicate its assessment of the available evidence. If other citations beyond the one already provided are relevant, it would be best to provide them. (Katharine Mach, IPCC WGII TSU)	Issue addressed in rewrite, the phrase 'emerging evidence' removed.
273	61286	12	7	27	7	30	Some adaptation strategies or interventions may exacerabte human security. This point is important for designing policies aiming to enhance adaptation to climate change. (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	Agreed see changed sentences and meaning conveyed.
274	61287	12	7	27	7	30	In certain cases interventions that have sought to increase the ability of communities to cope with flooding have had the unintended consequence of decreasing their ability to respond to drought. This is an additional example of adaptation interventions increasing exposure to other hazards (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	Both negative and positive responses described in the rewrite.
275	73451	12	7	27	7	30	A concluding sentence such as "The effectiveness of adapation to increase security depends on the current spread of people and resources." is needed after the final sentence in this section. (UNITED STATES OF AMERICA)	Point made in a similar manner in re-write of this paragraph

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
276	58695	12	7	33	11	23	This section dedicates disproportionate attention to local communities, indigenous people, and traditional knowledge. Climate change equally poses challenges to global industrial civilization as a whole, including related forms of knowledge. As you state on p. 9, line 14, there are something like 500 million indigenous people worldwide. That's about 8% of the global population. With all due respect, you should pay more attention to the cultural implications of climate change for the remaining 92%. You have dedicated an incredible amount of work to this section, which has proliferated to almost 20% of the chapter length. Painful as it may be, I suggest pruning it down to 10% and then adding more content on the implications of climate change for industrial civilization so that the final length of this section should again be close to (but no more than) 20%. For information about the social and political implications of climate change for industrial civilization, see Jörg Friedrichs (2013) <i>The Future Is Not What It Used to Be: Climate Change and Energy Scarcity</i> , Cambridge, MA: MIT Press. I've sent the galley version to wg2-ar5-wg2-ar5-supportingmaterial@ipcc-wg2.gov. It's a PDF, and the file name is "Friedrichs 2013". The book is due to appear on 9 August this year, and I'm asking you to use the galley only for the report and not to circulate it. (Joerg Friedrichs, University of Oxford)	The preapproved outline specifies that this chapter should focus on communities. The IPCC report WGII will contain a separate chapter on Urban conditions.
277	73452	12	7	33	11	23	Section 12.3: This entire section on "Cultural dimensions of human security" "[needs to emphasize its relevance to] for this chapter. The authors should consider removing the 12.3 section from the security chapter of this report and considering where else this information fits into the document. If the 12.3 section is not removed then this chapter needs to clarify that it is dealing with two scopes: large-scale security that deals with global and state security, and smaller scale security that deals with concerns such as indigenous welfare (generally welfare and security are considered separate but related issues). The emphasis and the bulk of the evidence should be discussing large-scale security issues. As it is written it seems like indigenous groups are the most important factor when dealing with global security issues (which is not the case). The link between indigenous knowledge and security is tenuous at best- this either needs to be fleshed out and clarified or moved to another section of the report. Of the whole 12.3.4 section, "Local and traditional forms of knowledge," "[the only information needed is found in the sentence "There is strong evidence that mutual integration and coproduction of local and traditional and scientific knowledge will enhance resilience, increase adaptive capacity and reduce vulnerability." (p. 10, lines 47-49). Suggest the authors revise to reflect dual states of global and state level security, and more local, indigenous, and cultural dimensions. (UNITED STATES OF AMERICA)	Cultural dimensions is a part of the agreed upon outline and can therefore not be removed. The clarification that the chapter deals with two aspects of security will be included in the introductory section of the chapter.
278	59007	12	7	35	8	31	The section on 'how culture interacts with climate impacts' could acknowledge that culture is a 'contested term' that is widely viewed as an arena of struggle/negotiation/fluidity etc (as with 'community' which is later referred to as a contested term). The fact that cultures exist globally, not just among indigenous people, could be underscored. It is clear which case-studies/examples derive from research with indigenous communities, it is less clear where studies have been conducted among cultural groups in the 'Global North'. (Celia McMichael, La Trobe University)	Text changed to: "Culture is a contested and highly fluid term that is defined in this Chapter as material and non-material symbols that express collective meaning. In all societies culture is expressed in knowledge, worldviews, beliefs, norms, values and social relationships". In this definition culture shapes resilience, and drives both adaptive and maladaptive responses, among indigenous and non-indigenous societies and groups.
279	61288	12	7	37	7	40	One wonders if the catch-all working definition of culture outlined in 12.3.1 is actually workable, namely: "encompassing knowledge, worldviews, beliefs, norms, values, social relationships, perceptions of risk, power relations and responses to the world"... (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	The broad definition is chosen to ensure that relevant and accepted aspects of culture are not excluded. A broad definition is needed in this context.
280	73453	12	7	37	8	34	This section would benefit from an explicit reference to reliance on informal institutions, not just formal ones and not just state ones. This is often culturally driven and has important implications, especially in terms of raising awareness that investment in the most effective/legitimate institutions will yield the highest return (and they may not be state institutions or even formal institutions). Moreover, the highest adaptive and coping capacities of a society may be managed through informal institutions. (UNITED STATES OF AMERICA)	We have merged the section "How Culture interacts with Climate Impacts" with the section on "Community and Culture at Risk". This allows for a discussion of the role of community and collective action as informal institutions and the role they place in adapting to climate change.
281	66710	12	7	38	7	42	References should be in chronological order (and alphabetical order in the years). (Peter Burt, University of Greenwich)	Correction has been made

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
282	61289	12	7	42	7	43	Does identity and sense of belonging also contribute to collection actions and adaptation? Why does this only refer to how identity may contribute to polarisation of power relations and conflicts? Collective action is related to identity formation and maintenance which is referred to in 12.3.2 and particularly 'place-based groups' and community attachment. Perhaps collective action and identity should be linked more explicitly somewhere in the text. (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	We have merged the section "How Culture interacts with Climate Impacts" with the section on "Community and Culture at Risk". This allows for a discussion of the role of community and collective action in adapting to climate change.
283	80097	12	7	42	7	43	"This assessment....." Referring to which assessment? Good to be very clear The entire sentence is quite challenging to grasp – any possibilities to clarify/modify (or remove)? (Mikko Halonen, Gaia Consulting Oy)	Sentence has been removed in rewrite.
284	69156	12	7	45	7	50	Inadequate referencing for climate change impacts on human security (NETHERLANDS)	This comment appears to be general and not relate specifically to the section "How Culture Interacts with Climate Impacts". We have added more references in this next draft in order to strengthen the arguments it makes.
285	58995	12	7	49	0	0	very odd statement--significant cultural implications simply because it has consequences for people? (Ken Conca, American University)	Given the definition of culture that is applied in this chapter we are confident that climate change has consequences for people that will result in implications for cultural aspects that are important to people.
286	66711	12	7	49	7	49	'et al.' should be in italics (Peter Burt, University of Greenwich)	Amended
287	82558	12	7	49	7	49	As calibrated uncertainty language, "high confidence" should be italicized. (Katharine Mach, IPCC WGII TSU)	Amended
288	73454	12	7	50	7	50	"knock-on" is a colloquialism, use more formal language. (UNITED STATES OF AMERICA)	Knock-on' has been removed.
289	69157	12	7	52	8	3	Full Reference of Oswald Spring et al. 2013 is missing. (NETHERLANDS)	Correction has been made: reference has been removed from text
290	66712	12	7	53	7	53	Delete comma after 'fishing'. (Peter Burt, University of Greenwich)	Amended
291	62027	12	7	53	8	3	This sentence should include unpredictable weather, as we have found in the Alaskans Sharing Indigenous Knowledge (www.AKSIK.org) project. Also, Oswald Spring et al. 2013 is not in the References. (Jon Rosales, St. Lawrence University)	Sentence as it was written has been removed for clarity
292	73455	12	7	54	8	3	Section 12.1: One concept definition missing in this section is that of direct and indirect climate impacts. This concept is best defined in Section 12.2, Subsection 12.3.1, page 7, beginning on line 54 and continuing on the top of the next page (page 8) in lines 1 through 3. This definition needs to be worked into Section 12.1, because, after all the Chapter is about climate impacts, and need to be addressed early in the Chapter. (UNITED STATES OF AMERICA)	The chapter now more explicit in Section 1 about how direct and indirect impacts affect human security - through both impacts on life and livelihood risks and indirectly through other routes.
293	66713	12	8	4	8	4	Delete comma after 'depend'. (Peter Burt, University of Greenwich)	Amended
294	73456	12	8	4	8	4	Please delete the comma after "depend". (UNITED STATES OF AMERICA)	Amended
295	69158	12	8	9	8	9	Insert 'et' after Adger reference (NETHERLANDS)	Amended
296	66259	12	8	12	8	23	The statement: "cultural embedded perception in some cases increases human security and in some cases are negative to (...) of facilitating or hindering adaptation" does not give meaning as long as the following sentences does not outline how perceptions either facilitates or hinder adaptation. (Halvor Dannevig, Western Norway Research Institute)	Sentence has been changed to 'Culturally embedded perceptions of climate change may either facilitate or hinder adaptation with implications for human security' and subsequent sentences elaborate on this point.
297	66714	12	8	14	8	15	References should be in chronological order (and alphabetical order in the years). (Peter Burt, University of Greenwich)	Amended
298	69159	12	8	15	8	18	Unclear sentence starts with 'in scientific studies' and switches midway to 'anthropological studies'. Kuruppu and Liverman (2011) reference is good but there are many more studies confirming this (for example Slegers 2008, Vedwan and Rhoades 2001, Osbahr et al. 2011). (NETHERLANDS)	Sentence has been changed to "The way in which resource-dependent communities articulate and perceive climate change is often based on how English language terms are translated and understood in the local language".

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
299	80098	12	8	18	8	21	The word "both" seems to need some follow-up ? And ....? (Mikko Halonen, Gaia Consulting Oy)	Sentence deleted and replaced with "There are a number of anthropological studies that document how some cognitive frames do not perceive a changing climate and hence the concept of climate change itself does not have cultural resonance, whether or not the parameters of climate have been observed".
300	73457	12	8	19	0	0	The sentence implies that there are two variables "denial" and "?" because it states "and have observed BOTH denial,..." but there is no second variable explained. Add explanatory text or delete 'both'. (UNITED STATES OF AMERICA)	Sentence deleted and replaced with "There are a number of anthropological studies that document how some cognitive frames do not perceive a changing climate and hence the concept of climate change itself does not have cultural resonance, whether or not the parameters of climate have been observed".
301	69160	12	8	19	8	19	Omit 'both' before denial (NETHERLANDS)	Amended
302	66715	12	8	20	8	21	References should be in chronological order (and alphabetical order in the years). (Peter Burt, University of Greenwich)	Amended
303	59008	12	8	21	8	23	The suggestion that climate change denial can be explained as being due to 'paralysis in the face of externally-imposed change' seems to be too reductive/narrow. There are other explanations that are documented in research: lack of understanding of climate science, personal experience is of day-to-day 'weather' rather than 'climatic change' etc. (Celia McMichael, La Trobe University)	The sentence has been deleted.
304	61290	12	8	25	8	31	Tebboth 2013 (Understanding intractable environmental conflicts: the case of the village that wouldn't fall quietly into the sea; Geographical Journal in press) explores how the issue of coastal erosion in Happisburgh, Norfolk has been framed and the implications this has for agreeing a mutually acceptable solution. The research specifically focused on the differences in understanding between local and national actors; it supports the main assertions of the paragraph and could be cited as additional evidence. (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	Reference not available
305	66267	12	8	25	8	31	This publication documents how scientific knowledge of future climate change have been instrumental in getting adaptation to climate change on the municipal planning agenda: Dannevig, H., Rauken, T., & Hovelsrud, G. (2012). Implementing adaptation to climate change at the local level. Local Environment, 17(6-7), 597–611. doi:10.1080/13549839.2012.678317 (Halvor Dannevig, Western Norway Research Institute)	Reference has been added with additional text: Scientific information on weather variability and change is framed through cultural practices that can both enable (Dannevig et al., 2012) and constrain (Roncoli, 2006) adaptation.
306	73458	12	8	25	8	31	See paper on the importance of institutions in this regard. Barnett, J. and M. Webber, 2010: Migration as Adaptation: Opportunities and limits. In: Climate Change and displacement: Multidisciplinary perspectives. Hart Publishing, Oxford. Pgs 37-56. (UNITED STATES OF AMERICA)	Reference is included later in the chapter
307	62028	12	8	26	8	26	The term "local farmer" should be rethought. All farmers are local, unless we are referring to global farming corporations I suppose. I think the sentence should be ended after the word "assimilated." Why isolate farmers as examples of people who may not understand or assimilate climate change information? (Jon Rosales, St. Lawrence University)	Sentence has been deleted
308	73459	12	8	29	8	30	The point of the second to last sentence is not clear. How is cosmology linked to human security. This point need to be more clearly articulated or deleted. (UNITED STATES OF AMERICA)	The sentence has been modified and the word cosmologies has been removed.
309	58696	12	8	34	0	0	The table is too dense and somewhat overloaded with bullet points and reference. As a consequence, it may be useful for your internal drafting purposes but it's hardly helpful to the reader. In its current form, it further adds to the length of this already somewhat oversized section rather than making it more handy and nimble. (Joerg Friedrichs, University of Oxford)	The table has been edited for clarity and length. The references have been kept to guide the readers.
310	61291	12	8	43	8	46	It should be pointed out that community-level adaptation is useful for reducing risks and building capacity at the community level. Adaptation plans and action are still required at other spatial scales (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	Comment added to that affect in the section, though the sentence not amended.
311	66716	12	8	44	8	46	References should be in chronological order (and alphabetical order in the years). (Peter Burt, University of Greenwich)	Amended
312	66717	12	8	46	8	46	Insert comma after 'Specifically'. (Peter Burt, University of Greenwich)	Amended

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
313	61292	12	8	46	8	52	Community led action is important for adapting to climate change. Hierarchical power relations (state interventions, regulations) can hinder this process. (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	Sentence has been amended to refer to the structural barriers to community-led action and barriers resulting from colonial history and from political and economic globalization.
314	66718	12	8	48	8	48	Delete comma after 'learning'. (Peter Burt, University of Greenwich)	Amended
315	73460	12	8	50	8	52	An additional sentence should be inserted to explain why hierarchical power relations impede collective action. (UNITED STATES OF AMERICA)	Sentence has been amended to refer to the structural barriers to community-led action and barriers resulting from colonial history and from political and economic globalization.
316	66719	12	8	51	8	52	References should be in chronological order (and alphabetical order in the years). (Peter Burt, University of Greenwich)	Amended
317	66720	12	9	3	9	5	References should be in chronological order (and alphabetical order in the years). (Peter Burt, University of Greenwich)	Amended
318	73461	12	9	7	9	9	Local community responses are also shaped by political and economic globalization. Additional citation: Regional drought has a global impact, Troy Sternberg Nature 472, 169 (14 April 2011). (UNITED STATES OF AMERICA)	This is not a full peer reviewed scientific article but a correspondence.
319	73462	12	9	7	9	9	This last sentence was unclear, please explain further the decoupling process that was being alluded to here. (UNITED STATES OF AMERICA)	Sentence has been changed: Local community responses are also shaped by colonial history (Marino, 2012), and by political and economic globalization (Keskitalo, 2009)
320	80099	12	9	7	9	9	"Local community...." The sentence includes important information but could be written in a more understandable manner (or cut into two parts?) (Mikko Halonen, Gaia Consulting Oy)	Sentence has been changed. See above comment.
321	69161	12	9	8	9	8	Crucial reference missing that links economic globalisation with responses: O'brien et al. 2004 (NETHERLANDS)	Reference has been added.
322	73463	12	9	12	10	9	Section 12.3.3: The extensive focus on indigenous issues give undue weight to those groups as more vulnerable than others. Further, this section gives the impression that indigenous groups are vulnerable regardless of circumstance, when there are many indigenous people and groups who live in urban areas, for instance, where their vulnerability may be different. All vulnerable groups and populations should be addressed in this chapter with the same detail. (UNITED STATES OF AMERICA)	The preapproved outline specifies that this chapter should focus on indigenous peoples, hence it is necessary to include a separate section. They are not presented here as being more vulnerable than other people. Instead the intention is to highlight what aspects of IPs are impacted by climate change. This does not imply that there are other communities with similar conditions that are not indigenous. Text has been added to reflect that IPs also live in urban areas.
323	62990	12	9	14	0	0	about or up to, not both statements. (Helen Ross, The University of Queensland)	Amended
324	73464	12	9	14	9	15	Please revise the beginning of this sentence for clarity. (UNITED STATES OF AMERICA)	Sentence has been re-written
325	60601	12	9	14	10	9	The discussion in this section is rather static with respect to other changes, in particular economic, affecting the human security of indigenous peoples. Some comment on other factors that climate change might be warranted in this section. (Michael Brzoska, University of Hamburg)	The dynamic nature of the conditions of indigenous peoples are reflected in several of the paragraphs - and the importance of economic conditions are noted.
326	62274	12	9	15	9	15	See on indigenous rights: Rodolfo Stavenhagen: Pioneer on Indigenous Rights (Heidelberg – Dordrecht – London – New York: Springer-Verlag, 2013); Rodolfo Stavenhagen: The Emergence of Indigenous Peoples (Heidelberg et al.: Springer, 2013). Rodolfo Stavenhagen: Peasants, Culture and Indigenous Peoples: Critical Issues (Heidelberg et al.: Springer, 2013). (Hans Guenter Brauch, Free University of Berlin)	The section does not address indigenous rights specifically, due to the page limit. It is therefore not feasible to include a separate discussion on indigenous rights.
327	62991	12	9	18	0	19	not clear what this is saying, can you expand with another sentence? (Helen Ross, The University of Queensland)	Edits made: Climate change poses challenges for many indigenous peoples, including to post-colonial power relations, cultural practices, their knowledge systems and adaptive strategies. For example, the extensive literature on the Arctic shows that changing ice conditions pose risks in terms of access to food and increasingly dangerous travel conditions

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
328	60399	12	9	18	9	20	I cannot access all of the papers referenced in this short section on the 'significant linkages between historical colonization and current climatic changes' but would only use 'significant' if statistically so. This applies to the use of the term on both line 18 and line 20. (Christopher Smith, United Nations University)	Significant has been replaced with clear linkages and substantial populations
329	66721	12	9	19	9	19	References should be in chronological order (and alphabetical order in the years). (Peter Burt, University of Greenwich)	Amended
330	66722	12	9	19	9	19	'et al' should be in italics, with a full stop after the 'l' and a comma before the date. (Peter Burt, University of Greenwich)	Amended
331	61293	12	9	20	9	23	Quite a long sentence and it sounds as if it is leading to a counter argument which is not made. (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	Sentence has been expanded on.
332	82559	12	9	27	9	27	In place of "general agreement," the chapter team should consider using summary terms for agreement (and evidence) to communicate its assessment, following the uncertainties guidance for authors. (Katharine Mach, IPCC WGII TSU)	Corrections made
333	61294	12	9	32	9	38	The list about ineffectiveness of traditional practices should also include reference to attempts by numerous governments (for example) to restrict movement of traditionally mobile groups thus reducing their security and increasing their exposure. Indeed Morrissey (2009; Environmental Change and Forced Migration: A State of the Art Review. Background Paper. Oxford: University of Oxford.) and Castles (2010. Understanding Global Migration: A Social Transformation Perspective. Journal of Ethnic and Migration Studies, 36, 1565-1586.) highlight a sedentary bias within much development thinking (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	Issues of government planning that restrict mobility are dealt with implicitly in the paragraphs on resettlement policy and practice
334	73465	12	9	32	9	38	This last sentence should be reconstructed for clarity. The structure following the colon is very hard to follow. (UNITED STATES OF AMERICA)	Edits made
335	61295	12	9	40	9	41	Why is post-colonial power relations mentioned here? The next sentence talks about the Arctic so no link to post-colonial powers. (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	Sentence has been edited for clarity and better connection to the following sentence.
336	66723	12	9	40	9	41	Sweeping statement. Surely not all indigenous peoples? (Peter Burt, University of Greenwich)	Sentence deleted
337	62029	12	9	41	9	43	We have learned with the AKSIK project that sea ice also dampens storm surges. This point is documented on our website (www.AKSIK.org). We are submitting this information for publication this summer so I am not sure if you can use this point. (Jon Rosales, St. Lawrence University)	This was also discussed in SWIPA - AMAP 2011
338	82560	12	9	41	9	43	Cross-references to relevant material in Chapter 28 could be provided for this statement. (Katharine Mach, IPCC WGII TSU)	Amended
339	66724	12	9	48	9	48	Insert ')' after '2011'. (Peter Burt, University of Greenwich)	Amended
340	66725	12	9	48	9	48	Insert comma after 'Ross'. (Peter Burt, University of Greenwich)	Amended
341	66726	12	9	49	9	49	Insert comma after 'ACIA'. (Peter Burt, University of Greenwich)	Amended
342	66727	12	9	51	9	51	Insert comma after 'Nuttall'. (Peter Burt, University of Greenwich)	Amended
343	66728	12	9	53	9	53	Insert comma after 'Wiiams'. (Peter Burt, University of Greenwich)	Amended
344	62992	12	10	1	0	0	I recommend rewording this statement to clarify. They are traditionally highly involved in resource management, but in many cases they are excluded from or marginalised within formal, government decision-making about resource management (e.g. formation of policies, access to programs). (Helen Ross, The University of Queensland)	Edits made to and changes reflect suggestions in comment.
345	66729	12	10	3	10	4	References should be in chronological order (and alphabetical order in the years). (Peter Burt, University of Greenwich)	Amended
346	61296	12	10	4	10	5	what is the risk related to tourism development and industrial activities? The problem seems to be that their voice is not heard. Not obvious what the link is between participation in management or decisions and climate change and the development of industry? (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	Edits made: 'While providing economic opportunities, tourism development and industrial activities are particular areas of risks for indigenous peoples when they are not involved in decision-making (Petheram et al., 2010).' The link is that climate change opens up for more industrial activity - and is therefore indirect. it is the consequences of climate change i.e. industry that poses the risks and opportunities

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
347	62993	12	10	5	0	0	...and reaping benefits (Helen Ross, The University of Queensland)	Edits made: While providing economic opportunities, tourism development and industrial activities are particular areas of risks for indigenous peoples when they are not involved in decision-making.
348	80100	12	10	6	10	9	"Lack...." Suggest cutting the sentence in two (e.g. after first brackets => "However, there are.... ) (Mikko Halonen, Gaia Consulting Oy)	Edits made to reflect comment
349	62994	12	10	10	0	11	I find the issue of land rights and resource rights conspicuously missing from this review. Having, or not having, land rights and resource rights (which can include marine resources), interacts with the arguments above. It affects direct access to the resources (many of which are very important culturally), and likelihood of being included in government decision-making, cf p. 10 line 1. (Helen Ross, The University of Queensland)	Reference to indigenous rights have been added where feasible, and is already included albeit a bit vague. The issue of property rights is recognised as a potential source of conflict in section 12.5.2. More could be said about this issue in the chapter, but we are unable to add more text due to the constraints of word limits.
350	64913	12	10	12	10	46	See also Nakashima, D.J., K. Galloway-McLean, H.D. Thulstrup, A. Ramos Castillo, and J.T. Rubis (2012). Weathering Uncertainty: Traditional Knowledge for Climate Change Assessment and Adaptation. UNESCO and UNU, Paris and Darwin, 120pp. And See also Climatic Change Special Issue (in press) on Climate Change Mitigation and Adaptation with local Communities and Indigenous Peoples (Amejali Ramos Castillo, United Nations University - Institute of Advanced Studies)	Nakashima et al 2012 is already included
351	56346	12	10	12	11	23	This section does not do justice to the role of local cultural traditions. For example, p.11.l.15 states that local cultures may not have the means to cope with unprecedented conditions under climate change. This is unfair to say because it remains to be seen whether western scientific knowledge has the means to respond. And it should not be ignored that it is modern science-based culture that is the CAUSE of climate change in the first place. The passage does not mention the fact that indigenous cultures have been largely sustainable (though they too often did modify the environment) and are hence more 'advanced' than modern western culture in a very important sense. Indigenous cosmologies also contain more ecologically sound ideas about the human-nature relationship that need to be taken seriously. Further corporatisation and industrialisation of global agriculture, often in the developing countries where most indigenous people live, is threatening what remains of their sustainable ways of life, and there is a dangr that hare brained climate change adaptation schemes could accelerate this process. The growing literature on food sovereignty takes up many of these issues. (Thomas Reuter, University of Melbourne)	The assessment is about the current situation and does not address the causes for global warming - or the difference between traditional and scientific knowledge. The section points to literature that present findings about the changing role of knowledge in some areas and communities. The section does note that indigenous peoples have been highly adaptable in the past. The concerns of the reviewers have already been taken care of in the current text.
352	82561	12	10	14	10	14	In place of "agreement," the chapter team should consider using summary terms for agreement (and evidence) to communicate its assessment, following the uncertainties guidance for authors. (Katharine Mach, IPCC WGII TSU)	High has been added.
353	66730	12	10	21	10	21	Change 'knowledges' to 'knowledge'. (Peter Burt, University of Greenwich)	Amended
354	61297	12	10	24	10	26	The argument can be made that regardless of whether the knowledge is objectively valid or not, the perceptions people have is what drive their behaviour, actions and adaptations therefore including traditional knowledge which will influence perceptions and worldview is necessary part of understanding social change. This is highlighted in the FAQ 12.1 on page 25 (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	Text has been modified to include reference to perceptions
355	58996	12	10	25	10	26	The three reasons why local knowledge matters are well framed here, but the remainder of the section does not follow this framework--each of the 3 points should be explained, established, and cited. (Ken Conca, American University)	This is a good point, but such changes to text are not feasible given the word limit.
356	63275	12	10	27	10	27	"serve" should read "serves" (Christian Webersik, University of Agder)	Amended
357	66731	12	10	27	10	27	Change 'provide' to 'provides'. (Peter Burt, University of Greenwich)	Amended
358	85158	12	10	27	10	27	Do you really think that traditionnal knowledge, necesarily based on local observations, can compete with scientific modelisations based on a worldwide obsevational network and the laws of fluids mechanics for weather forecasting ?. (Michel Petit, CGIET rue de Bercy)	The two forms of knowledge have different functions in society and complement each other.
359	66732	12	10	28	10	29	References should be in chronological order (and alphabetical order in the years). (Peter Burt, University of Greenwich)	Amended
360	66733	12	10	33	10	33	Insert space after first 'and'. (Peter Burt, University of Greenwich)	Amended
361	66734	12	10	34	10	36	References should be in chronological order (and alphabetical order in the years). (Peter Burt, University of Greenwich)	Amended



#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
362	66735	12	10	38	10	38	Insert comma after 'Africa'. (Peter Burt, University of Greenwich)	Amended
363	69162	12	10	40	10	41	It should be noted that this evidence is from Mexico and it shouldn't be extrapolated to all mountainous regions (NETHERLANDS)	Corrections have been made
364	66736	12	10	46	10	47	References should be in chronological order (and alphabetical order in the years). (Peter Burt, University of Greenwich)	Amended
365	82562	12	10	47	10	47	In place of "strong evidence," the chapter team should consider using summary terms for evidence (and agreement) to communicate its assessment, following the uncertainties guidance for authors. (Katharine Mach, IPCC WGII TSU)	Changes have been made to reflect this comment
366	66737	12	10	49	10	51	References should be in chronological order (and alphabetical order in the years). (Peter Burt, University of Greenwich)	Amended
367	61298	12	11	1	11	7	The authors should emphasise that assessments of climate change and human security issues used by decision makers should incorporate traditional knowledge alongside scientific knowledge. It is very useful for effective policy making and decisions because people's actions and behaviours are based on their perceptions which are influence by lay knowledge. It needs to be carefully considered however as some traditional knowledge may conflict with scientific information. It should be taken as complementary. (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	This point is important and is captured the Executive Summary, as well as in the section on traditional knowledge.
368	77400	12	11	19	11	23	Another example relevant to the Himalayan context described here centres on other forms of interventions (such as foreign aid to address acute malnutrition) that have also inadvertently resulted in loss of knowledge. This loss of 'know-how' has also resulted in losses to key cultural values and revered customs that are seen as key assets to support activities such as tourism as an adaptation and diversification strategy of livelihood options (e.g. Adler, et al., 2012). In other words, losses of key endemic knowledge can also restrict options for adaptation in support of multiple valued outcomes, such as poverty alleviation. REF: Adler, C.E., McEvoy, D., Chhetri, P., Kruk, E. (2012). The role of tourism in a changing climate for conservation and development. A problem-oriented study in the Kailash Sacred Landscape, Nepal. Policy Sciences, online first: DOI 10.1007/s11077-012-9168-4 (Carolina Adler, Swiss Federal Institute of Technology (ETH) Zurich)	Reference added
369	58998	12	11	26	16	9	I do not understand the organizing principle for this section. What are the pathways by which climate change leads to or alters patterns of migration? The discussion is divided into extreme events and longer-term climate change, which is not an effective way to organize what we know. It would be more helpful first to conceptualize the causal; pathways and say what we know about each, and then discuss the resultant consequences for human security (Ken Conca, American University)	Good point - the section has been reorganised and the headings amended to help clarity and exposition
370	80207	12	11	28	14	49	12.4.1: impacts of cc on displacement, migration, and mobility: since the chapter uses the word "evidence" so often, consider increasing the references to empirical work. 2011 Afifi and Jäger did a special edition of International Migration summarizing the EACH-FOR case studies which were the first-time global empirical research project of 23 case studies on enviornmental change and forced migration scenarios. Neuchatel and IOM 2012 bibliography lists newer references. Also could reference Gunvor Jonnson's (2009) review of about 40 case studies in Sub-Saharan Africa, Warner, K. & T. Afifi (2013) Where the rain falls: Evidence from 8 countries on the circumstances under which households use migration to manage the risk of rainfall variability and food insecurity, Climate and Development, Vol. x, No. x, pp. xx-xx. (Koko Warner, United Nations University - Institute for Environment and Human Security)	All studies included in original systematic review, Warner and Affifi reference added.

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
371	80208	12	11	30	12	10	12.4.1.1 evidence on cc and migration: Etzold, B.; A. Ahmed; S. Hasan & S. Neelormi (2013) Clouds gather in the sky, but no rain falls. Vulnerability to rainfall variability and food insecurity in Northern Bangladesh and its effects on migration, <i>Climate and Development</i> , Vol. x, No. x, pp. xx-xx; Murali, J. & T. Afifi (2013) Rainfall variability, food security and human mobility in the Janjgir-Champa district of Chhattisgarh State, India, <i>Climate and Development</i> , Vol. x, No. x, pp. xx-xx; Sakdapolrak, P.; P. Promburom & A. Reif (2013) Why successful in-situ adaptation with environmental stress does not prevent people from migrating? Empirical evidence from Northern Thailand, <i>Climate and Development</i> , Vol. x, No. x, pp. xx-xx; Van der Geest, K.; N.C. Thao & N.V. Khoa (2013) A wealth group-differentiated analysis of climate impacts and migration in the Upper Mekong Delta, Vietnam, <i>Climate and Development</i> , Vol. x, No. x, pp. xx-xx; Rademacher-Schulz, C.; Schraven, B. and E.S. Mahama (2013) Time matters – shifting seasonal migration in Northern Ghana in response to rainfall variability and food insecurity, <i>Climate and Development</i> , Vol. x, No. x, pp. xx-xx; Afifi, T.; E. Liwenga & L. Kwezi (2013) Rainfall induced crop failure, food insecurity and outmigration in Same-Kilimanjaro, Tanzania, <i>Climate and Development</i> , Vol. x, No. x, pp. xx-xx; Milan, A. & S. Ruano (2013) Rainfall variability, food insecurity, migration and trapped populations in Cabricán, Guatemala, <i>Climate and Development</i> , Vol. x, No. x, pp. xx-xx; Milan, A. & R. Ho (2013) Livelihood and migration patterns at different altitudes in the Central Highlands of Peru, <i>Climate and Development</i> , Vol. x, No. x, pp. xx-xx; Smith, C. (2013) Modeling migration futures: Development and testing of the Rainfalls Agent-Based Migration Model-Tanzania, <i>Climate and Development</i> , Vol. x, No. x, pp. xx-xx (Koko Warner, United Nations University - Institute for Environment and Human Security)	Many of the papers, in information sent by the authors directly, did not meet the eligibility deadline, and are not included. Most are reinforcing the main conclusions of the section rather than overturning them.
372	61299	12	11	32	11	33	The sentence that states that existing migration systems may be disrupted by climate change should also acknowledge that they may not be disrupted by climate change. The best predictor of population movement is previous movement and, for well-established systems, climate change might have a negligible effect: this should be acknowledged (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	Accepted and amended in the text, particularly in opening paragraphs of Section 4
373	62995	12	11	33	0	0	could be disrupted, or expanded? (Helen Ross, The University of Queensland)	Disrupted' can be negative or positive
374	68284	12	11	34	11	35	I think that the definition of migration ("permanent move by a person of at least one year") is too restrictive. A lot of publications, of which some are also cited in AR5 (e.g. van der Keest 2011, Rademacher-Schulz and Mahama 2012), suggest that temporarily more limited forms of migration (in particular seasonal migration) are also of an enormous significance for human security. (Benjamin Schraven, German Development Institute)	This is the standard demographic definition. We have refer to temporary and seasonal migration
375	66738	12	11	34	11	36	I think this sentence would be better as an introduction to the section (ie move to line 32). (Peter Burt, University of Greenwich)	This paragraph has been changes
376	62275	12	11	41	11	41	The best recent report is: United Nations Populations Division, 2012: World Urbanization Prospects, the 2011 Revision (New York: UN); at: < <a href="http://esa.un.org/unup/index.html">http://esa.un.org/unup/index.html</a> > should be added. (Hans Guenter Brauch, Free University of Berlin)	The numbers we are using are integrative
377	66740	12	11	41	11	41	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
378	66739	12	11	41	11	42	References should be in chronological order (and alphabetical order in the years). (Peter Burt, University of Greenwich)	Amended
379	66172	12	11	45	0	0	Add 'Mountain people have long adjusted to living in fragile and marginal environments. Migration is long-established as a consequence of the marginal conditions within many mountain zones, but also represents an important potential form of adaptation to such conditions.' Citation: Banerjee, Soumyadeep, Richard Black, Dominic Kniveton, Michael Kollmair (2012) The changing Hindu Kush Himalayas: Environmental change and migration. In Etienne Piguet & Frank Laczko (Eds.) People on the move in a changing climate - Comparing the Impact of Environmental Change on Migration in Different Regions of the World. Global Migration Issues Series. Amsterdam : Springer. [Forthcoming]. (International Centre for Integrated Mountain Development (ICIMOD))	Forthcoming paper does not meet eligibility deadline. Reingforces rather than overturns the point made.
380	68285	12	11	45	11	45	A reference to the Foresight report would be quite meaningul here as this touches on one of the most critical findings of the report. (Benjamin Schraven, German Development Institute)	Foresight 2011 report (through grey literature), has been included as a significant source of evidence in this field - referred to at the start of the Section.
381	70559	12	11	45	11	45	I suggest substituting "census period, even though cities..." with "census period. However, cities..." (Andrea Milan, United Nations University Institute for Environment and Human Security)	Noted but not amended

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
382	66173	12	11	49	0	0	Add citation Banerjee, Soumyadeep, Jean-Yves Gerlitz and Dominic Kniveton (2012) A methodology for assessing patterns of labour migration in mountain communities exposed to water hazards. In Faist, Thomas and Jeanette Schade (Eds.) Disentangling Migration and Climate Change, Chapter 4. Heidelberg/London: Springer International. [Forthcoming] (International Centre for Integrated Mountain Development (ICIMOD))	Forthcoming paper does not meet eligibility deadline. Reingforces rather than overturns the point made.
383	66741	12	11	49	11	49	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
384	66742	12	11	52	11	53	References should be in chronological order (and alphabetical order in the years). (Peter Burt, University of Greenwich)	Amended
385	66743	12	11	52	11	53	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
386	78009	12	12	0	14	0	Consider identifying the combination of repeated extreme weather events with slower biophysical changes, such as erosion and sea level and its impact on mobility - see, Bronen, R. and Chapin, F.S., Adaptive governance and institutional strategies for climate-induced community relocations in Alaska, Proceedings of the National Academy of Sciences, May 20, 2013, <a href="http://www.pnas.org/content/early/2013/05/16/1210508110.full.pdf+html">http://www.pnas.org/content/early/2013/05/16/1210508110.full.pdf+html</a> , doi:10.1073/pnas.1210508110 (Robin Bronen, University of Alaska)	Amended in line with the comment and citation included
387	65527	12	12	1	12	10	There are various methods that could be added here with various references. See my previous comment 6. There are also Participatory Research Approaches and Household Surveys that could be used. See for example: Rademacher-Schulz, C., Afifi, T., Warner, K., Rosenfeld, T., Milan, A., Etzold, B. and Sakdapolrak, P., 2012. Rainfall variability, food security and human mobility. An approach for generating empirical evidence; Intersections No. 10. Bonn, Germany. There are also modeling exercises in that context that can be drawn from several articles, such as: Smith, C. (2013) Modeling migration futures: Development and testing of the Rainfalls Agent-Based Migration Model-Tanzania, Climate and Development. (Tamer Afifi, United Nations University Institute for Environment and Human Security)	Mainly reinforces findings - these forthcoming and grey literature articles have not been included
388	73466	12	12	1	12	10	The authors should add a more robust discussion of resource abundance as an outcome of climate change and it's relation then to human security. Specifically, changed seasonality of weather and increasing periods of intense rain, for example, as well as abundance in terms of net gain in resources such as water. Since rate of change and variability have been noted in the chapter as the most significant determinants of adaptive capacity, abundance is a critical issue. Moreover, this chapter should attempt to move the discussion beyond a narrow focus on resource scarcity and more into the realm of governance and management of available resources, whatever they may be and however they might change (e.g. don't forget the importance of access, not availability when it comes to human security and conflict). (UNITED STATES OF AMERICA)	Good point and reflected in the re-write of this section and in Table 12.3 that outlines some of these scarcity relationships
389	80215	12	12	1	12	10	Several additions could be made to this paragraph on research methods: Agent-Based Modeling is not mentioned (for example the work of Chris Smith in Burkina Faso (2012) and Tanzania (2012). Second, the use of mixed methods increasingly used in empirical work / field studies (ethnographic, participatory research approaches, household surveys, see Rademacher et al. 2012, and Warner 2011 (Rademacher-Schulz, C., Afifi, T., Warner, K., Rosenfeld, T., Milan, A., Etzold, B. and P. Sakdapolrak (2012). Rainfall variability, food security and human mobility. An approach for generating empirical evidence. Intersections No. 10. Bonn: UNU-EHS. ; Warner, K. 2011. Environmental change and migration: methodological considerations from ground-breaking global survey. Journal of Population and Environment. Popul Environ (2011) Vol. 33. No. 1. 3-27. Doi 10.1007/s11111-011-0150-4. ISSN 0199-0039). Third, the paragraph talks about the use of surveys without mentioning Bilsborrow and Henry's 2012 paper in Population and the Environment Journal on "The use of survey data to study migration-environmental relationships in developing countries: alternative approaches to data collection" which is relevant to the climate change and migration context (and not yet referenced in the chapter) (Koko Warner, United Nations University - Institute for Environment and Human Security)	Mainly reinforces findings - these forthcoming and grey literature articles have not been included
390	60400	12	12	3	12	5	In addition to the methodological paper by Piguet (2010) a more recent paper by McLeman is available: McLeman, R., 2013: Developments in modelling of climate change-related migration. Climatic Change, 117 (3), pp599-611. <a href="http://link.springer.com/article/10.1007%2Fs10584-012-0578-2">http://link.springer.com/article/10.1007%2Fs10584-012-0578-2</a> . However, both the Piguet and McLeman papers conclude that, at the time of their publication, no substantive agent-based modelling results were published. This is not the case for the McLeman (2013) paper, as noted by later references used within chapter 12. I imagine it is unnecessary to verify this within the chapter though. (Christopher Smith, United Nations University)	The methods discussion has been shortened to highlight that there are a varioety of methods and cross refer to these methods papers and reviews in the literature

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
391	61300	12	12	3	14	22	The authors should emphasise that coastal areas are vulnerable to climate change and at the same time have some of the highest populations with increased migration towards the coastline. Policy measures addressing risks of climate change impacts on human security should be a priority. (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	Demographics of coastal change and the drift to the coast included, specifically with reference to de Sherbinin results.
392	66744	12	12	4	12	4	Insert space after 'in'. (Peter Burt, University of Greenwich)	Amended
393	66174	12	12	5	0	0	Add citation Banerjee, Soumyadeep, Jean-Yves Gerlitz and Dominic Kniveton (2012) A methodology for assessing patterns of labour migration in mountain communities exposed to water hazards. In Faist, Thomas and Jeanette Schade (Eds.) Disentangling Migration and Climate Change, Chapter 4. Heidelberg/London: Springer International. [Forthcoming] (International Centre for Integrated Mountain Development (ICIMOD))	Mainly reinforces findings - these forthcoming and grey literature articles have not been included
394	63277	12	12	5	12	5	Insert following citation on climate change and human mobility: Hastrup, Kirsten and Karen Fog Olwig. 2012. Climate change and human mobility: global challenges to the social sciences. Cambridge [England] ; New York: Cambridge University Press. (Christian Webersik, University of Agder)	Noit included - reinforces the findings of the primary literature already cited.
395	69163	12	12	5	12	5	Here an additional citation can be useful as it thoroughly reviews the use of analogies in vulnerability research: Ford, James D., et al. "Case study and analogue methodologies in climate change vulnerability research." Wiley Interdisciplinary Reviews: Climate Change 1.3 (2010): 374-392. (NETHERLANDS)	This reference was not included since this chapter has the mandate to review literature specific to the impact of climate change on aspects of human security, in this case, migration. Other chapters of the volume will address the use of analogies in assessing vulnerability more generally.
396	61301	12	12	8	12	10	There is an important qualifier in 12.4.1.1 that should be flagged upfront, e.g. in the executive summary: "As with all the major elements of human security in this Chapter, the issue of causality between environment or risk and the human security outcomes of migration are not established". This, by the way, will need proper framing as it could readily be dismissed as a major weakness. (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	Not a wekaness, but a feature of the human security domain which is a hybrid of issues and approaches. The methods and nature of evidence dealt with explicitly in Box 12.2 for this purpose.
397	58997	12	12	13	0	0	this section focuses exclusively on extreme events as a spur to migration. Presumably this is because more is known about this particular climate impact on migration, but the discussion should focus on climate impacts beyond extreme events, discussing both what is know and not known. (Ken Conca, American University)	The section has been completed restructured to redress the balance between migration from extreme events and migration from longer-term changes in the environment. Table 12-2 provides a range of examples of how environmental variables interact with migration.
398	80209	12	12	13	14	9	12.4.1.2 key rainfall findings on whether cc impacts increase or decrease mobility (check wording—displacement used interchangeably with mobility, need a citation that clarifies language like Nansen Initiative policy brief) (Koko Warner, United Nations University - Institute for Environment and Human Security)	Comment addressed, mobility and displacement are now used separately
399	78008	12	12	15	0	0	Differentiate between indiividual migration and community relocation/resettlement (Robin Bronen, University of Alaska)	This is not the theme in this part; not included.
400	61302	12	12	15	12	52	The concept of place attachment could be used to explain some of the trends in displacement or non-displacement. (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	The term place attachment is now included in the text
401	66745	12	12	17	12	17	Insert 'the' after 'in'. (Peter Burt, University of Greenwich)	done
402	59009	12	12	27	12	27	Structural causes of vulnerability - include both 'race' and 'ethnicity'? (Celia McMichael, La Trobe University)	Sentence has been re-written in light of comment
403	62276	12	12	27	12	27	structural causes of social vulnerability (add social) (Hans Guenter Brauch, Free University of Berlin)	Sentence has been re-written in light of comment
404	63278	12	12	30	12	30	Insert following citation dealing with slow recovery following Hurricane Katrina: Mutter, John. 2010. "Opinion: Disasters widen the rich–poor gap." Nature 466. (Christian Webersik, University of Agder)	Amended
405	82563	12	12	32	12	32	Casual usage of the word "unlikely" should be avoided, as the term is a reserved likelihood term in the uncertainties guidance for authors. (Katharine Mach, IPCC WGII TSU)	Changed in the text
406	73467	12	12	34	0	0	Gender is accidentally used interchangeably with women here. Gender means men and women. This sentence uses "they" where it should use "women". "...extreme events, especially when THEY lose..." (UNITED STATES OF AMERICA)	Changed in the text

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
407	68255	12	12	38	0	0	Seccion12.4.1.2. Regarding Restrict Mobility, there is a specific document on Climate Change and Accesibility in Latin America"which claims accessibility as a central item to be identified in the local planning process for the development and attention to the impacts of climate change in rural areas. It is necessary to raise the interest of the countries of Latin America in the investment and development of public policies to improve accessibility in line with economic, social, cultural and environmental rights of communities. Otherwise, emergency response to serious situations facing rural communities would be met with short-term vision. (Climate change, livelihoods and access to vulnerable communities: Colombian case pp. 33-38, ILO and theInternational Forum for Rural Transport and Development IFRTD, to be published). (Marek Harsdorff, ILO)	Paper in grey literature and not yet published - reinforces rather than contradicts the sense of the sentence
408	80200	12	12	38	0	52	Two paragraphs are not clear. Idea needs more elaboration. Some sentences are not complete. It does not distinguish between the independent and dependent variables. (Koko Warner, United Nations University - Institute for Environment and Human Security)	Paragraphs have been amended to improve clarity
409	65522	12	12	38	12	52	The two paragraphs are not clear content wise and the message is missing. The idea needs more elaboration. Some sentences are not complete. Also, the paragraphs do not distinguish between the independent and dependent variables. (Tamer Afifi, United Nations University Institute for Environment and Human Security)	Paragraphs have been amended to improve clarity
410	62277	12	12	45	12	45	Please add: Villagran, 2011: (The reference is to 2011 and not to 2009) (Hans Guenter Brauch, Free University of Berlin)	Amended
411	61303	12	12	47	12	47	Just as populations may not be displaced by extreme weather events so people may be attracted to an area that has suffered an extreme climate event. Current research in China provides anecdotal evidence of family members returning to sites that have recently experienced flooding or droughts to help family members and other members of the affected community cope with the effects (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	We await publication of rigorous studies for China
412	66746	12	12	48	12	48	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
413	73468	12	12	48	12	49	Sentence fragment. Please revise. (UNITED STATES OF AMERICA)	Amended
414	80101	12	12	48	12	49	sentence to be completed (Mikko Halonen, Gaia Consulting Oy)	Amended
415	62996	12	12	49	0	0	note unfinished sentence (Helen Ross, The University of Queensland)	Amended
416	66175	12	12	49	0	0	Add 'A regional study in the Hindu Kush Himalayas, found that the option of labour migration was not available in the livelihoods portfolio of some households for economic reasons. A lack of economic resources prevented 28 % of surveyed households from partaking in labour migration.' Citation: Add citation Banerjee, Soumyadeep, Jean-Yves Gerlitz and Dominic Kniveton (2012) A methodology for assessing patterns of labour migration in mountain communities exposed to water hazards. In Faist, Thomas and Jeanette Schade (Eds.) Disentangling Migration and Climate Change, Chapter 4. Heidelberg/London: Springer International. [Forthcoming] (International Centre for Integrated Mountain Development (ICIMOD))	We did not access this forthcoming study and did not ascertain whether it met the publication cut-off eligibility deadline. The example reinforces but does not alter the sense of the text.
417	66747	12	12	49	12	49	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
418	84635	12	12	49	12	52	Figure 12-1 appears to be theoretical/conceptual, asserting an inverse correlation, rather than empirical. It would be useful to clarify the nature of the evidence underlying the figure here. (Michael Mastrandrea, IPCC WGII TSU)	The Figure is indeed conceptual and comes from the Foresight review of evidence. The evidence has been scattered up till now, and some examples are given in Table 12.3.
419	61304	12	12	51	12	52	The opinion on 12.4.1.2 that "climate change risks may be the most significant when they reduce and constrain opportunities" seems to be stating the obvious (especially with the qualifier verb "may"... ) (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	Sentence amended in text
420	66748	12	13	3	13	3	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
421	84636	12	13	5	13	6	How does this statement and the discussion that follows intersect with the ES finding on mobility, which characterizes mobility as widely used and often effective? (Michael Mastrandrea, IPCC WGII TSU)	Now more closely allied to the ES points

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
422	61305	12	13	6	13	8	Just as populations may not be displaced by extreme weather events so people may be attracted to an area that has suffered an extreme climate event. Current research in China provides anecdotal evidence of family members returning to sites that have recently experienced flooding or droughts to help family members and other members of the affected community cope with the effects (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	We await the results of rigorous scientific studies of migration flows in China and whether there is any climate signal within them. Given their large population movements in China driven by economic opportunity in cities over the past two decades, it may be extremely difficult to detect such a signal
423	82564	12	13	16	13	20	The description of the table should be clarified, as there are only 2 columns within the table. It seems the intended descriptors are the relevant row numbers instead. (Katharine Mach, IPCC WGII TSU)	Description of table amended in text
424	61306	12	13	20	13	23	Additionally, climate change may lead to no additional impact on migration depending on the actual phenomena, its severity and the time scale in question. This point should be acknowledged (see also comment 10) (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	Table 12-2 focuses on the influence, and direction of change, of migration on climate change. In the subsequent draft we have strengthened references to non-migration under environmental change and the reasons why people stay.
425	56813	12	13	21	13	21	But there is no clear evidence on the magnitude of this effect (Thomas Bernauer, ETH Zurich)	Sentence amended in text
426	82565	12	13	22	13	22	Casual usage of the word "likely" should be avoided, as the term is a reserved likelihood term in the uncertainties guidance for authors. (Katharine Mach, IPCC WGII TSU)	The word likely has been removed from the sentence.
427	58697	12	13	25	0	0	The table reproduced at the end of the file does not match the one you describe here. It has only two columns and talks about issues other than mobility outcomes: drought and land degradation; flooding; sea level rise. The table you describe in the text seems to be missing, while the one reproduced at the end seems to belong somewhere else. (Joerg Friedrichs, University of Oxford)	References to table have been amended.
428	61307	12	13	29	13	35	These studies highlight two important issues: firstly, there is no consistent signal regarding the role of the environment (in fact empirical results can and do pull in opposite directions). Secondly, the actual mechanisms through which the environment manifests itself on migration are only postulated and often explored through proxies thus limiting the analytical and explanatory power of the studies. (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	Correct interpretation - also made visible by studies pointed to in Table 12.3
429	66749	12	13	30	13	30	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
430	61308	12	13	30	13	31	12.4.1.2 refers to pioneer migration to urban centres requiring capital and hence restricted to wealthier population. However, what about movement to the ever-expanding slums? (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	Evidence shows that pioneer migration is indeed restricted to those with minimum amount of resources. In rapidly urbanising cities in Africa and Asia they do indeed migrate to what Chapter 8 refers to as slums. But that does not contradict the point made. No change required.
431	66750	12	13	31	13	31	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
432	66751	12	13	33	13	33	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
433	60401	12	13	35	0	0	Rather than stating that decreased rainfall 'would significantly increase rates of out-migration from rural areas', as one of the authors on the Kniveton et al. (2011) paper referenced, I would be happier either removing 'significantly' or adding 'were simulated to' in place of 'would'. (Christopher Smith, United Nations University)	The word 'significantly' has been removed.
434	60402	12	13	35	0	0	The Kniveton et al. (2011) paper is followed by a Kniveton et al. (2012) paper that, in the context of Burkina Faso, suggests that climate change-related migration is likely to be highly nonlinear, with the extent of such nonlinearity dependent upon population growth. As such, migration policy interventions that involve demographic and climate change adaptation may be most appropriate. Citation - Kniveton, D.R., C.D.Smith, R.Black, 2012: Emerging migration flows in a changing climate in dryland Africa. Nature Climate Change, 2 pp444-447. <a href="http://www.nature.com/nclimate/journal/v2/n6/nclimate1447/metrics">http://www.nature.com/nclimate/journal/v2/n6/nclimate1447/metrics</a> (Christopher Smith, United Nations University)	Accepted and amended in the text
435	78012	12	13	37	0	49	evidence for 'displacement may initiate new conflict in receiving areas', see Hagenlocher, M., Lang, S. & Tiede, D. (2012): Integrated assessment of the environmental impact of an IDP camp in Sudan based on very high resolution multi-temporal satellite imagery. Remote Sensing of Environment, 126, pp. 27-38. (Peter Zeil, Center for Geoinformatics Z_GIS Salzburg University )	Discussion of migration receiving areas and conflict now in Section 5.

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
436	68286	12	13	37	13	49	A reference to the report "Climate change as a security risk" of the German Advisory Council on Global Change (2007) would make sense as it still gives a compact overview on the debate concerning the env. change-migration-conflict nexus (although it is six years old meanwhile) - in particular the part on "Conflict constellation: 'Environmentally induced migration':" (p. 119-122); <a href="http://www.wbgu.de/fileadmin/templates/dateien/veroeffentlichungen/hauptgutachten/jg2007/wbgu_jg2007_engl.pdf">http://www.wbgu.de/fileadmin/templates/dateien/veroeffentlichungen/hauptgutachten/jg2007/wbgu_jg2007_engl.pdf</a> (Benjamin Schraven, German Development Institute)	There are more recent peer-reviewed articles, not accepted
437	66752	12	13	39	13	39	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
438	60559	12	13	39	13	40	Citation here of Hendrix and Salehyan (2012) is misplaced; they just mention this relationship and cite Reuveny (2007). Instead you should cite Buhaug, Gleditsch and Theisen (2010), and Raleigh, Jordan and Salehyan (2008). Buhaug, Halvard, Nils Petter Gleditsch, and Ole Magnus Theisen, 2010: Implications of climate change for armed conflict. In Robin Mearns & Andy Norton (eds) Social Dimensions of Climate Change: Equity and Vulnerability in a Warming World. New Frontiers of Social Policy. Washington, DC: World Bank, 75-101. Raleigh, Clionadh, Lisa Jordan and Idean Salehyan, 2008: "Assessing the Impact of Climate Change on Migration and Conflict," Paper Prepared for the Social Dimensions of Climate Change, The World Bank. <a href="http://siteresources.worldbank.org/EXTSOCIALDEVELOPMENT/Resources/SDCCWorkingPaper_MigrationandConflict.pdf">http://siteresources.worldbank.org/EXTSOCIALDEVELOPMENT/Resources/SDCCWorkingPaper_MigrationandConflict.pdf</a> (Vally Koubi, University of Bern)	This discussion of migration and conflict now moved to Section 5 and integrated into the discussion. The sentences do not refer to grey literature World Bank Mearns and Norton paper.
439	73469	12	13	40	13	41	Though this sentence is true and consistent with the literature, at the same time, some may view this sentence as contradictory with other statements made about climate, resources and conflict and the authors for this reason may consider removing it. (UNITED STATES OF AMERICA)	Sentence has been amended to reflect this comment.
440	60561	12	13	41	0	0	Citation here of Hendrix and Salehyan (2012) is again misplaced. You should cite the recently published literature reviews on climate change-conflict nexus: Theisen, Gleditsch & Buhaug (2013), Bernauer, Böhmelt & Koubi (2012), or Scheffran et al., (2012). Scheffran, Jürgen, Michael Brzoska, Jasmin Kominek, Michael Link, and Janpeter Schilling, 2012: Climate change and violent conflict. Science 336(6083): 869-871. Bernauer, Thomas, Tobias Böhmelt, and Vally Koubi, 2012: Environmental changes and violent conflict. Environmental Research Letters 7(1): 015601 (1-8). Theisen, Ole Magnus, Nils Petter Gleditsch, and Halvard Buhaug, 2013: Is climate change a driver of armed conflict? Climatic Change 117(3): 613-625. (Vally Koubi, University of Bern)	Text amended and Bernauer reference included later in chapter.
441	60562	12	13	42	0	0	Reuveny's study did not focus on Africa. His sample was global with 15 out of the 38 cases examined occurring in Africa. His results are drawn from these 38 cases and not from Africa only. Hence, you should say: "...multiple cases of large scale population displacement from around the world..." (Vally Koubi, University of Bern)	Reference is not in amended text
442	56814	12	13	44	13	44	The research design of that study is highly problematic. It's results are therefore not reliable and robust. I would be very cautious in referring to any results from that study. (Thomas Bernauer, ETH Zurich)	Reference is not in amended text
443	82566	12	13	51	13	51	In place of "some evidence," the chapter team should consider using summary terms for evidence (and agreement) to communicate its assessment, following the uncertainties guidance for authors. (Katharine Mach, IPCC WGII TSU)	We have removed the phrase "some evidence" and replaced with appropriate summary terms as suggested.
444	68287	12	13	51	13	52	The sentence "...vulnerable to labour market discrimination, access to services such as health care and to crime..." sounds a little bit "faulty". It should rather be something like : "...vulnerable to labour market discrimination, their access to services such as health care is usually poor and they are often victims of crime..." (Benjamin Schraven, German Development Institute)	Accepted and sentence has been changed to reflect comment
445	73470	12	13	52	0	0	Two words are missing. The sentence should read "...labour market discrimination, LACK OF access to services such as..." (UNITED STATES OF AMERICA)	Accepted and amended in the text
446	66753	12	13	53	13	53	References should be in chronological order (and alphabetical order in the years). (Peter Burt, University of Greenwich)	Accepted and amended in the text
447	66754	12	13	53	13	53	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
448	61312	12	14	1	14	0	The fact that migrants move to area where they are more likely to be affected by climate change and weather events is an issue because areas with high migrant populations may be more vulnerable. (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	Accepted and the text now highlights that risks may increase with climate change for migrants moving to high-density areas.
449	66755	12	14	1	14	1	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
450	66756	12	14	2	14	2	Insert 'are' after 'residents'. (Peter Burt, University of Greenwich)	Amended
451	66757	12	14	2	14	2	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
452	66758	12	14	3	14	3	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
453	66759	12	14	4	14	4	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
454	61309	12	14	8	14	9	Similarly, the statement that "rapid growth of city populations does not drive urban unrest" does not seem to take account of the trend that we see more and more migration (globally) in the form of not only urbanisation but urbanisation in coastal areas, vulnerable to climate change. (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	This is not the theme in this part; not included
455	63450	12	14	12	14	49	In 12.4.1 you discuss the "Impacts of Climate Change on Displacement, Migration, and Mobility" and under 12.4.1.3. we see "Migration Trends and Long-Term Climate Change". I was surprised not to find any mention of the carbon footprints associated with both migration and resettlement processes. Whilst there may be little or no research in this field, it is important to highlight that there is a potential for future environmental migrants to be a further cause to an increase in GHG emissions. This is important because where planning exists it is imperative that sustainability is paramount, in order to reduce the "Impacts of Migration on Future Climate Change", e.g. relocating 72-184 million people because of sea-level rise cannot - in today's world at least - be a carbon neutral process and we ought to consider this in planning. (Diogo de Gusmao, Met Office Hadley Centre)	This is a good point though there is no significant academic literature about it. The proposition is that international migration may increase GHG intensity as individuals who move to more carbon intense economies rise to the average etc. But the main point of this section is the evidence that most displacement migration is localised, not international. Hence the effect suggested here is minor.
456	73471	12	14	12	14	49	Section 12.4.1.3: It would be helpful to include some discussion or reference discussion from 8.2 in terms of the ability of urban areas to adapt to migration. (UNITED STATES OF AMERICA)	This is not the theme in this part; not included
457	80210	12	14	12	14	49	12.4.1.3 migration trends cite Chris Smith's work (Smith, C. (2013) Modeling migration futures: Development and testing of the Rainfalls Agent-Based Migration Model-Tanzania, Climate and Development, Vol. x, No. x, pp. xx-xx) and the work of B.F., Banerjee ICIMOD 2011. (Koko Warner, United Nations University - Institute for Environment and Human Security)	Amended to update publication - accepted for publication in August 2013 in letter from author
458	73472	12	14	14	14	15	What is the reference for this first sentence? is this true globally? (UNITED STATES OF AMERICA)	Accepted and reference now included
459	60563	12	14	14	14	19	It might be worthwhile to cite Lilleør and Van den Broeck (2011) who provide a critical review of the existing theoretical and empirical research on how climate change and climate variability in Less Developed Countries (LDCs) could affect migration via their effect on personal income. Lilleør, H.B. and Van den Broeck, K., (2011) Drivers of migration and climate change in LDCs. Global Environmental Change 21, S70-S81. (Vally Koubi, University of Bern)	Accepted and reference now included
460	68288	12	14	14	14	49	Given the previous statements concerning the complexity and difficulty of establishing causal linke between climate change and migration/ displacement, the presentation of projections and modelling results in that section seems a little bit too unreflected and uncritical. (Benjamin Schraven, German Development Institute)	Amended to include nuance and explanation of how the modelling results relate to observational studies on processes of migration decision-making by individuals
461	66760	12	14	15	14	15	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
462	66761	12	14	18	14	18	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
463	66762	12	14	23	14	24	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
464	56815	12	14	25	0	0	there are loads of single country studies. overview matrix by country type of effect, and direction or magnitude effect info would be great here (Thomas Bernauer, ETH Zurich)	Attempted to classify these in Table 12.3 and cross refer to that issue
465	60403	12	14	25	0	0	I don't feel like the Kniveton et al (2011) citation is really appropriate here. In the context of the sentence it sounds like it should refer to either Mexico-US or internal Brazilian migration. (Christopher Smith, United Nations University)	Accepted, reference removed and text amended to reflect this.
466	66763	12	14	25	14	25	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
467	60564	12	14	25	14	28	It might be worthwhile to mention that the Barrios et al (2007) study reports that rainfall shortages increased rural out-migration only in Sub-Saharan Africa, but not elsewhere in the developing world. (Vally Koubi, University of Bern)	Barrios et al (2006) reference included to indicate that rainfall decline has been associated with increased urbanization in sub-Saharan Africa.
468	66764	12	14	30	14	30	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
469	66765	12	14	30	14	30	Change 'A' to 'An'. (Peter Burt, University of Greenwich)	Accepted and amended in the text
470	82567	12	14	30	14	38	Cross-references to relevant material in Chapter 5 should be provided. Additionally, "likely" on lines 31 and 36 and "very likely" on line 35 should be italicized if the terms are being used following the uncertainties guidance for authors. If not, casual usage of the reserved likelihood term should be avoided. (Katharine Mach, IPCC WGII TSU)	Cross-references have been added, and the appropriate terms italicised.
471	66766	12	14	32	14	32	Change 'metres' to 'm'. (Peter Burt, University of Greenwich)	Amended



#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
472	65821	12	14	33	14	33	Reword sentence 'if all coasts were protected with dikes and beach nourishment' to 'if coasts were protected by dikes and beaches nourished based on a demand for safety' The paper (Nicholls et al. 2011) did not model for dikes on all coasts, rather selected dike building based on population density. (Sally Brown, University of Southampton)	Accepted and sentence has been changed.
473	66767	12	14	34	14	34	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
474	61310	12	14	34	14	36	This may be assumed by Hallegatte et al but in reality many countries have not invested in coastal defences, including in France where investment is up to the local authorities and in the UK where a regional cost-benefit approach was taken and some place e.g.parts of Norfolk the approach is to let the sea take the land rather than invest in defences....what point is being made in this sentence? (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	Sentence amended and the urban focus of the Hallegatte paper now carefully worded.
475	56816	12	14	38	14	38	what does affected mean exactly (Thomas Bernauer, ETH Zurich)	Affected has been replaced by the word 'displaced'.
476	61311	12	14	40	14	49	Concept of place attachment could again be used here to explain these perceptions.... Link place attachment to 'culture and identity'. (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	Accepted, Adams and Adger (2013) has been inserted to address this point.
477	60565	12	14	45	14	46	the conclusion that 'the impacts of climate change may be more significant driver of future international migration' is too farfetched. One should not make this kind of generalization based on the case of Tuvalu, because international migration is probably the only type of migration available to Tuvalu residents. (Vally Koubi, University of Bern)	Accepted and text amended to reflect that these are the conclusions of the referenced papers.
478	56817	12	14	46	14	46	The existing data on climate related migration is so incomplete that it hardly allows for any robust conclusions on how short and long term environmental stressors differ in their impact on extent and forms of migration. See the recently presented paper at ISA - San Francisco - by Vally Koubi et al on environmental migration. That study also offers a discussion of the existing data on environmental migration. I would very much welcome a strong statement here stressing the need for much better household level data on environmental migration. (Thomas Bernauer, ETH Zurich)	Data needs and research priorities now highlighted in Box 12.2 including those on migration and the need for data
479	73473	12	14	47	0	48	Past migration flows are the greatest predictors of future flows in what sense? Authors should explain further--is this spatially, in terms of where new migrants will settle, or something else? (UNITED STATES OF AMERICA)	This is a standard finding from the new economics of labour migration (NELM) - it means that migration systems are fairly fixed and predictable in the short run till policy changes or other signals change the relative attractiveness of destination areas.
480	69164	12	15	1	15	1	This is general comment: the term value has been used many times in the chapter. Again, it is unclear what the authors mean by the notion of value and whether they endorse a specific school here. This could for instance be interesting to add when they discuss migration (for instance in 12.4.2). See for instance the discussion of Peter Cannavo on the fundamental value of 'home' and 'place' in Cannavo, P. 2008. In the Wake of Katrina. In Political Theory and Global Climate Change, edited by S. Vanderheiden. Cambridge: MIT Press: 177-200. The concept of 'value' deserves more attention when we discuss human security. (NETHERLANDS)	Issue of value is included in the opening discussion and definition of human security - elements of life and livelihood that are valued by individuals and societies. But we have sought to clarify value throughout.
481	61313	12	15	1	16	11	We appreciate the inclusion of a separate section 12.4.2 on "migration as an adaptation to climate change impacts" and the statement in box 12-4 that "the term climate refugees is not meaningful". (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	Accepted
482	61314	12	15	3	15	6	China has recently begun to relocate communities considered to be living in marginal environments that are becoming uninhabitable due to climate change. This relocation policy is badged as adaptation to climate change and may be worth including in this section. (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	We await publication of rigorous studies of resettlement and adaptation for China
483	73474	12	15	3	15	11	This section raises concerns regarding the potential for interventions such as these to "do harm" in conflict-affected and fragile situations where economic and political power balances, for example, could be affected. This section should apply a warning that such interventions should be undertaken in a conflict sensitive manner, applying the best available conflict analysis to inform program and policy design and implementation. Refer to the OECD DAC's Principles for Good International Engagement in Fragile States and Situations. (UNITED STATES OF AMERICA)	Accepted and the text has been amended

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
484	68289	12	15	3	16	9	In the introductory section four areas of government intervention are mentioned. But the rest of the text virtually deals only with resettlement and legal protection. A little bit more on the other areas of government intervention would be desirable. Furthermore, a conclusion on the presented discussion of options for legal protection of "environmental/ climate refugees" would be nice. (Benjamin Schraven, German Development Institute)	A concluding sentence has been added to the Box 12-4 Evidence on the Existence of Environmental Migrants and International Policy to Protect Them. With respect to addressing the other areas of government intervention: social protection mechanisms are addressed in other chapters on adaptation and so are not addressed here.
485	66768	12	15	5	15	6	References should be in chronological order (and alphabetical order in the years). (Peter Burt, University of Greenwich)	Amended
486	66777	12	15	5	16	5	Change 'internal' to 'internally' (Peter Burt, University of Greenwich)	Accepted and amended in the text
487	73475	12	15	7	15	7	Cash Transfers as the only example of a social protection mechanism seems too specific. There need to be more examples or this specific example should be cut. (UNITED STATES OF AMERICA)	Accepted and example has been cut
488	66176	12	15	11	0	0	Add 'Despite these various potential benefits and impacts of migration, little is known about the specific role of migration in the context of adaptation to climate-related stressors. Whilst financial remittances may be spent on both structural and non-structural adaptation measures to reduce household vulnerability to environmental hazards, it is far from clear what circumstances – social, political or economic – are most propitious for this kind of spending. There are knowledge gaps in terms of the conditions that make it most likely for social remittances to play a positive role in building adaptation specifically to climate change.' Citation Banerjee, Soumyadeep, Richard Black, Dominic Kniveton (2012) Migration as an effective mode of adaptation to climate change. This paper was commissioned by Foresight as a contribution to European Commission policy reflection on climate change and migration. Foresight: HM Government. (International Centre for Integrated Mountain Development (ICIMOD))	Accepted and amended in the text
489	71352	12	15	13	0	0	Suggest changing to "thawing permafrost". (CANADA)	Accepted and amended in the text
490	78010	12	15	13	15	25	Consider adding a reference to and synopsis of governance challenges identified in Bronen, R. and Chapin, F.S., Adaptive governance and institutional strategies for climate-induced community relocations in Alaska, Proceedings of the National Academy of Sciences, May 20, 2013, <a href="http://www.pnas.org/content/early/2013/05/16/1210508110.full.pdf+html">http://www.pnas.org/content/early/2013/05/16/1210508110.full.pdf+html</a> , doi:10.1073/pnas.1210508110 (Robin Bronen, University of Alaska)	Accepted and reference now included
491	62279	12	15	15	15	15	Biermann. Boas 2012: "Climate Change and Human Migration: Towards a Global Governance System to protect climate refugees", in: Scheffran et al. 2012a: 291-300. (Hans Guenter Brauch, Free University of Berlin)	Accepted and reference now included
492	66769	12	15	15	15	15	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
493	66770	12	15	16	15	17	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
494	62278	12	15	18	15	18	See e.g. ; Vol. 16: Suwattana Thadaniti (Ed.): The Impact of Displaced People's Temporary Shelters on their Surrounding Environment (Heidelberg – Dordrecht – London – New York: Springer-Verlag, 2014). (Hans Guenter Brauch, Free University of Berlin)	Not eligible as published after deadline. No mention of wther this reinforces or is contrary to the findings reported in this sentence, hence not included.
495	66771	12	15	18	15	18	References should be in chronological order (and alphabetical order in the years). (Peter Burt, University of Greenwich)	Amended
496	61315	12	15	19	15	19	Understanding why people do not displace in extreme weather events is just as important as why people do displace and how. Policy measures should be focused also on these 'trapped populations', identified in the recent EU strategy on climate change adaptation , 16.4.2013 SWD(2013) 138 final. (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	This term is used in biology, not in migration
497	66772	12	15	25	15	25	Move '(' to after 'Marino' and delete comma. (Peter Burt, University of Greenwich)	Accepted and amended in the text
498	61316	12	15	29	15	29	Box 12-4 I was not sure whether this was the right title for the box. The text mostly covers issues related to international policy and climate refugees rather than whether these refugees exist or not which the title suggests (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	The first sentences in the box somewhat dismiss the logic of referring to refugees (in the literature) but the remainder of the box discusses proposed changes to international law and protection mechanisms

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
499	73476	12	15	31	0	44	This information is not pertinent to the topic of security. There is no reason to include the background arguments about appropriately classifying people as migrants vs. refugees (or, if there is a reason, it needs to be clarified) (UNITED STATES OF AMERICA)	The box reflects a specific literature that argues that reclassifying migrants as environmental refugees would alter their citizenship rights etc. and directly enhance their security. This is a contested area and the authors judged that it was important to summarise this area of political science and socio-legal studies
500	58698	12	15	31	16	9	As mentioned in one of my comments on the chapter as a whole, it seems to me that you are sometimes presenting your own "critical" views while not allocating enough space to the views criticized. Here, for example, you devote ample space to literature critical of the notion of "climate refugees" while hardly devoting any space to those who have introduced that notion in the first place. While this is fairly common in social scientific circles, in the context of an IPCC report it is problematic because critics may then accuse you of being biased. (Joerg Friedrichs, University of Oxford)	The box reflects the present scientific consensus in international relations and other areas, that the original proposal to classify all potential migrants as environmental refugees is flawed. Virtually all the present literature makes that case. The key research area at present is in socio-legal studies and international relations concerning whether refugee status would be defensible or desirable - the box attempts to fairly represent the balance of that debate
501	66773	12	15	33	15	34	References should be in chronological order (and alphabetical order in the years). (Peter Burt, University of Greenwich)	Amended
502	66774	12	15	33	15	34	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
503	66775	12	15	44	15	44	References should be in chronological order (and alphabetical order in the years). (Peter Burt, University of Greenwich)	Amended
504	66776	12	15	48	15	49	References should be in chronological order (and alphabetical order in the years). (Peter Burt, University of Greenwich)	Amended
505	65525	12	16	0	0	0	This sub-section 12.5 would be enriched by adding the following article: Etienne Piguet (2012): From "Primitive Migration" to "Climate Refugees": The Curious Fate of the Natural Environment in Migration Studies, Annals of the Association of American Geographers, DOI:10.1080/00045608.2012.696233 (Tamer Afifi, United Nations University Institute for Environment and Human Security)	Good suggestion - reference added
506	77500	12	16	0	18	0	The diverse putative causal connections between climate change and the onset of violence could be conceptually sketched out in more detail before evidence is presented. First, there are direct (temperature, drought, volatile rains, floods, extreme weather events, changes in borders) and indirect pathways to violence (through migration, economic growth, food production/prices). The kinds of violence that could result include inter-state violence, civil wars, subnational conflict, and riots/strikes. Most but not all of these items are discussed in detail, but new work on the indirect pathways to violence, particularly related to food production/food prices and the emergence of conflict are not mentioned. Cullen Hendrix's work for the FAO and World Bank is relevant (the FAO piece linked below is forthcoming in peer reviewed outlet). Other relevant work by Marc Belemare and Todd Smith. , <a href="http://www.fao.org/fileadmin/templates/cfs_high_level_forum/documents/FI-ConflictDynamics-Hendrix_Cullen.pdf">http://www.fao.org/fileadmin/templates/cfs_high_level_forum/documents/FI-ConflictDynamics-Hendrix_Cullen.pdf</a> , <a href="http://www.strausscenter.org/ccaps/publications/research-briefs.html?download=151">http://www.strausscenter.org/ccaps/publications/research-briefs.html?download=151</a> , <a href="http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2107132">http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2107132</a> (Busby Joshua, University of Texas-Austin)	Paragraph on migration and conflict has now been reduced. The proposal here is for grey literature that does not alter the thrust of the argument so not included.
507	73477	12	16	16	17	27	This section does a good job at recognizing that there is no single cause of armed conflict and that climate change (or resource scarcity) is no exception to this rule, while still recognizing that climate variability and environmental change has contributed to conflict in the past. Suggest keeping this balance through out the rest of the section (UNITED STATES OF AMERICA)	We have endeavoured to maintain balance throughout, though the specific paragraph on migration conflict has been subsumed into the conflict section
508	80211	12	16	16	18	50	12.5.1 This section should draw on the literature coming out of the "CLICO" project supported by the European Union. This project has undertaken case studies examining the relationship between climate change, water, and conflict at different levels and focuses on "differentiated" adaptive capacity--finds that the underlying social structures that ameliorate conflict are under increasing pressure from climatic stressors and how they interact with societies (like in Niger, Mediterranean region, etc.) (Koko Warner, United Nations University - Institute for Environment and Human Security)	The relevant published articles from the CLICO project are already cited, e.g: Buhaug 2010; Fietleson et al. 2012, and Bernauer et al. 2012,

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
509	73481	12	16	18	0	0	There should be some clear definitions offered for conflict at the start of this section. The definitions developed by the Uppsala Conflict Data Program have become standard in the field, so I would suggest using those (or, at least, using close adaptations). (UNITED STATES OF AMERICA)	Definitions added.
510	73480	12	16	18	0	38	This section makes grand claims with very few citations Resource scarcity rarely escalate[s] to violence, and violent conflict itself has generally become less common and less intense since 1991 is not necessarily true and depends entirely on which metric is being used. Two citations are not sufficient to make a claim of this size. This whole section needs significantly more research. (UNITED STATES OF AMERICA)	Wording of this sentence has been nuanced, and additional citations included where appropriate to increase the robustness of the evidence.
511	60566	12	16	18	16	20	it would be better and more accurate if you say that research investigates the relationship between climate change and violent conflict (the one-way causal effect of climate change on conflict), rather than their interaction. Note that interaction refers to the process by which different things affect each other or change each other. (Vally Koubi, University of Bern)	Sentence has been altered.
512	73478	12	16	18	16	21	In addition to the cited references discussing the possible role of climate change in conflict, the 2009 UNEP report "From Conflict to Peacebuilding: the Role of Natural Resources and the Environment" provides valuable insight and should be cited. This report states that over that past sixty years, forty percent of all intrastate conflicts have a link to natural resources. Although the report includes non-climate related resources (minerals, oil, etc.), it does explore the potential consequences of climate change for water availability, food security, and prevalence of disease. Furthermore, it implicates natural resources in all phases of conflict from contributing to the outbreak to undermining prospects for peacebuilding. (UNITED STATES OF AMERICA)	The UNEP report is largely about peace building, and it is part of a larger body of research about peace building and natural resource management that is discussed in section 12.5.4. The connections between natural resource exploitation and conflict are tangential to the issue of the effects of climate change on conflict - the former is not a good analogy for the latter. However, section 12.5.2 discusses the risk that violent conflicts might arise of changes in land use arising from climate change policies. We have not added new text to address this comment.
513	73479	12	16	18	16	27	This section should define "conflict". Currently the text moves haphazardly between discussions of violent and non-violent conflict and between inter-communal and state violence. (UNITED STATES OF AMERICA)	Definitions have been added.
514	66778	12	16	18	19	34	Within this section there is a complete change in the style of citing in-text references. I have not listed these individually, they are too numerous, but the section needs a careful proof check, and I am concerned to see these discrepancies at this stage. Also, for consistency elsewhere, et al. needs to be in italics. (Peter Burt, University of Greenwich)	The whole, chapter has been carefully edited to ensure consistency
515	56955	12	16	19	16	20	Delete "reflecting policy discourses that climate change impacts and resource scarcity could escalate conflict risks". There is no analytical benefit in mentioning this. (Tobias Ide, Research Group Climate Change and Security)	Sentence has been deleted
516	62280	12	16	20	15	20	add ... escalate conflict risks (Homer-Dixon 1999, 2001, 2006) Homer-Dixon, Thomas F., 1999: Environment, Scarcity, and Violence (Princeton, NJ: Princeton University Press); Homer-Dixon, Thomas F., 2001: The Ingenuity Gap (New York - Toronto: Alfred A. Knopf); Homer-Dixon, Thomas F., 2006: The Upside of Down: Catastrophe, Creativity and the Renewal of Civilization (Washington D.C.: Island Press). The chapter only cites the critics of this view. This discussion is highly contested in the environmental security literature. However, the cases of Homer-Dixon(1999) did not refer to climate change. (Hans Guenter Brauch, Free University of Berlin)	The phrase in question has been deleted.
517	66779	12	16	20	16	20	Delete comma after 'markets' (Peter Burt, University of Greenwich)	Amended
518	56956	12	16	20	16	21	How exactly will climate change "bring groups of people into conflict over [...] markets"? I did not understand that, so maybe some explanation and references (in the best case: both) seem necessary. (Tobias Ide, Research Group Climate Change and Security)	Sentence has been deleted
519	56957	12	16	20	16	21	Conflicts will not only be about "public goods", but also over private goods (consider e.g. privatized water sources, cattle/food owned by individuals and/or the state which are is stolen during raids etc.). (Tobias Ide, Research Group Climate Change and Security)	Sentence has been deleted
520	60567	12	16	20	16	21	Climate change could by exacerbating resource scarcity lead to conflict. But it is not clear to me why 'changes in climate will bring groups of people into conflict over property rights, markets, and public goods'. Elsewhere (and repeatedly) in this chapter you state that institutions including property rights could mitigate the effects of climate change on conflict. Hence the meaning of this sentence is not clear. You also need to provide reference for this statement. (Vally Koubi, University of Bern)	Sentence has been deleted

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
521	73482	12	16	20	16	21	Declarative verb probably not appropriate here and should be changed to "Changes in climate MAY bring groups of people into conflict over property rights, markets and public goods".. (not WILL). (UNITED STATES OF AMERICA)	Sentence has been deleted
522	80102	12	16	20	16	21	"Changes in climate will bring groups of people into conflict over property rights, markets, and public goods" Change : Will => Can Note: page 18, line 4.5 on Darfur: "... studies dispute the identification of the Darfur conflict as being caused by climate change, arguing that attributing this conflict to CC masks the culpability of actors and the major drivers of insecurity" (Mikko Halonen, Gaia Consulting Oy)	Sentence has been deleted
523	82568	12	16	21	16	21	Where "evidence" is mentioned, the chapter team should consider using summary terms for evidence (and agreement) to communicate its assessment, following the uncertainties guidance for authors. (Katharine Mach, IPCC WGII TSU)	The use of the word 'evidence' has been reviewed and qualified where possible.
524	56959	12	16	21	16	22	Since the circumstances under which resource scarcity drivers innovation and adaptation are indeed quite specific, and since adaption and innovation can themselves become relevant factors for violent conflict onset, evidence about adaptation and innovation as consequences of resource scarcity do not SET OF the risk of violent conflict as a consequence of resource scarcity. (Tobias Ide, Research Group Climate Change and Security)	Sentence has been deleted
525	58999	12	16	22	16	24	These claims about resource scarcity and violence should be specific as to the type of violent conflict being referenced (presumably, large scale and sustained violence such as civil war and interstate war) (Ken Conca, American University)	Sentence has been deleted
526	73483	12	16	22	16	24	This statement needs to be qualified, as it is certainly not one of fact. It should read along the following lines: "There is also evidence that resource scarcity does not necessarily escalate to violence, and that violent conflict itself has generally become less common and less intense since 1991". Furthermore, to balance that statement, a statement or statements referencing evidence that natural resources can have a relationship with conflict should be included. For example, see the 2012 Special Issue "Climate Change and Conflict" from the Journal of Peace Research, for a number of case studies which do find some statistically-significant correlations between climate change, resource scarcity and violence (most of it intra-state and communal - eg conflict between pastoralists and agriculturalists, etc). Furthermore, see the UNEP report "From Conflict to Peacebuilding: the Role of Natural Resources and the Environment," which finds 18 conflicts since 1990 linked to natural resources. <a href="http://www.unep.org/publications/search/pub_details_s.asp?ID=3998">http://www.unep.org/publications/search/pub_details_s.asp?ID=3998</a> (UNITED STATES OF AMERICA)	Sentence has been deleted
527	60568	12	16	24	0	0	What is the meaning of 'risks between climate change and conflict'? If you refer to the possibility that climate change increases the risk of conflict, please rewrite the sentence. (Vally Koubi, University of Bern)	Sentence has been rewritten for clarity
528	66780	12	16	25	16	25	Text unclear: what do you mean by 'This Chapter'? Grammatically you are referring to Chapter 19, but are you implying Chapter 12? (Peter Burt, University of Greenwich)	Sentence has been deleted
529	60569	12	16	25	16	27	Again, the term 'interaction' is inappropriate. Researchers, at least until now, are interested in establishing a one-way causal effect of climate change on conflict, that is whether climate change affects the likelihood of conflict and revealing the exact pathways through which climate change does so. (Vally Koubi, University of Bern)	Sentence has been deleted
530	82569	12	16	25	16	27	For this conclusion, it would be preferable to provide calibrated uncertainty language to summarize the author team's degree of certainty in the statement. (Katharine Mach, IPCC WGII TSU)	Sentence has been deleted
531	73484	12	16	29	0	44	The conclusions from Butzer 2012 study seem to be overstated in relation to the other studies. "This evidence from historical antecedents cannot be taken to mean future changes in climate will lead to large-scale political collapse due to diverse changes and globalization in the contemporary world (Butzer 2012)." This same section, lines 42-44, goes on to describe how these historical studies can be taken to show the connection between climate change and political disruption (29-30). It is not clear why the authors choose to emphasis in lines 29-30 that these studies "cannot be taken to mean" anything. The emphasis really should be on how these studies should not be ignored, as they can provide important tools for building resiliency for a future that climate science has already shown, with a high degree of certainty, will be quite extreme (see the Synthesis 12.7 (3-4) conditions in most places that in will be without any precedent in human history (New, M., D. Liverman, H. Schroder, and K. Anderson, 2011: Four degrees and beyond: the potential for a global temperature increase of four degrees and its implications. Philosophical Transactions of the Royal Society A, 369(1934).The emphasis would be better placed on noting that while adaptation and modern ingenuity may lessen the degree to which climate change can be linked to political disruption, historical antecedents are still important. (UNITED STATES OF AMERICA)	Sentence has been deleted

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
532	82570	12	16	29	16	29	Where "a modest amount of research" is described, the chapter team should consider using summary terms for evidence (and agreement) to communicate its assessment. (Katharine Mach, IPCC WGII TSU)	We have reviewed the text and qualified where possible.
533	58699	12	16	29	16	38	I suppose that you are dismissive of this literature because the circumstances of ancient civilizations seem so different from the current human condition. However, this may be precisely the reason why that literature deserves more attention. We simply do not have any adequate proxies to study climate change in the modern era, and industrialization provides various social buffers that for a while can shield us off from the adverse effects of climate change. Once these buffers have been eroded, however, it may turn out that the closest parallel to what we will be facing is precisely historical patterns of climatic stressors spurring premodern societies either to become more complex or leading to their demise. For an extensive discussion of the literature on ancient Mesopotamia and the medieval Norse Settlements in Greenland and Iceland, see Jörg Friedrichs (2013) The Future Is Not What It Used to Be: Climate Change and Energy Scarcity, Cambridge, MA: MIT Press (pp. 60-71). The galley is available from wg2-ar5-supportingmaterial@ipcc.wg2.gov. It's a PDF, and the file name is "Friedrichs 2013". The book will appear on 9 August this year, and I'm asking you to use the galley only for your report and not to circulate it. (Joerg Friedrichs, University of Oxford)	The text does not imply dismissiveness. We were unable to locate this reference at the identified address, and so have not been able to consider if it should be included.
534	61317	12	16	29	16	38	A point to be emphasized here is that changes in climate and natural resource can result in violent conflicts and there is evidence of this from historical records of society collapse which highlight this. The situation is different now for many reasons including globalisation as is mentioned but what to note is that climate change can cause changes in the distribution of natural resources which can affect human security. (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	This issue is addressed throughout the section, and in the relevant ES point.
535	56958	12	16	29	16	44	As you notice in lines 36-38, the conclusions one can draw from past climate-violence links for today and the future is extremely limited. I thus suggest to shorten the two paragraphs on it. (Tobias Ide, Research Group Climate Change and Security)	As other reviewers note, there is value in the discussion, the length is appropriate.
536	62281	12	16	37	16	42	Most historical cases refer to cases of climate variability and not to the impact of anthropogenic climate change. Therefore projections from these cases to the future must be taken with utmost care. (Hans Guenter Brauch, Free University of Berlin)	As noted in lines 45-46.
537	73485	12	16	40	0	0	Define Little Ice Age. (UNITED STATES OF AMERICA)	Little Ice Age well understood in climate change science and hence not qualified, though the sentence has been amended for clarity
538	62282	12	16	40	16	40	What are inconsistent political institutions? "unstable" may be a better term!! (Hans Guenter Brauch, Free University of Berlin)	Inconsistent institutions are institutions that do perform consistently, this is not the same as 'unstable'
539	57673	12	16	40	16	44	So, you have five studies that conclude that cold increases violence. Why do you suppress this in the summary? (Richard S.J. Tol, Vrije Universiteit Amsterdam)	Summary points are summaries, in our view this is not a finding that warrants inclusion in the ES.
540	56818	12	16	42	0	0	So far, the whole discussion is on violent conflict as a (potential) cause of climate change... (Thomas Bernauer, ETH Zurich)	It is unclear what the recommendation here is, no changes have been made in response to this comment.
541	73486	12	16	46	0	51	While there is little research about conflict between states, there are numerous studies showing conflict and climate change on a sub-state scale. See the Journal of Peace Research special Climate Change Volume (January 2012; 49 (1). (UNITED STATES OF AMERICA)	Agreed, this is discussed on page 17
542	82571	12	16	47	16	47	Casual usage of the word "unlikely" should be avoided, as the term is a reserved likelihood term in the uncertainties guidance for authors. (Katharine Mach, IPCC WGII TSU)	This paragraph has been deleted and the content moved to section 12.6
543	73487	12	16	50	0	51	The statement "All studies show" is incorrect and cannot be given any weight, especially given that there is no citation. Either delete or clarify and provide additional references. (UNITED STATES OF AMERICA)	This paragraph has been deleted and the content moved to section 12.6
544	56960	12	16	50	16	51	It are not only robust institutions, but also power asymmetries and a bad cost-value ratio that can explain the absence of environment-related violent conflict between states. See, for instance: Selby, Jan (2005): The Geopolitics of Water in the Middle East. In: Third World Quarterly 26(2), 329-349. Zeitoun, Mac/Warner, Jeroen (2006): Hydro-hegemony. In: Water Policy 8(5), 435-460. (Tobias Ide, Research Group Climate Change and Security)	This paragraph has been deleted and the content moved to section 12.6
545	73488	12	16	52	0	0	The claim that war between states is increasingly rare needs more than one citation or should be deleted, and at least re-characterized. This statement is not necessarily true and depends entirely on which metric is being used. (UNITED STATES OF AMERICA)	This paragraph has been deleted and the content moved to section 12.6

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
546	73491	12	17	1	0	0	There should be some language here making it clear that the causal drivers for armed conflict (armed contests between organized groups) are different from violent crime. The points made in this paragraph are very important. It is important also to distinguish armed conflict from criminality. (UNITED STATES OF AMERICA)	Paragraph has been deleted in response subsequent reviewers comments (including comments from the United States)
547	73489	12	17	1	0	12	What definition are they using for violent crime? What about fragility and other conflict indicators beyond crime? Why is there so much emphasis on the studies related only to temperature? Temperature increase is only one part of climate change. As the next paragraph (15-27) explains factors such as changes in rainfall variability, not just temperature are linked with increases in conflict. Table 12.1 also outlines the first and second order affects of climate change on human security. If this chapter is going to devote an entire paragraph to temperature, then it should provide the same for other climate factors (i.e., precipitation) if it is available. If such information is not available then it should be listed in a new section on research gaps and needs. (UNITED STATES OF AMERICA)	Paragraph has been deleted in response to this and subsequent reviewers comments
548	73490	12	17	1	0	13	This section is inconclusive and does not add to the thesis of the chapter. Is an increase in temperature associated with an increase in violent crime? It is unclear based on this paragraph. Clarify or delete. (UNITED STATES OF AMERICA)	Paragraph has been deleted in response to this and subsequent reviewers comments
549	56961	12	17	1	17	13	Given the length of the paragraph: Is crime a form of violent conflict? If yes, what is your definition of violent conflict? If no, why is it still important to incorporate evidence on it (in such a relatively extensive matter) in the AR5? (Tobias Ide, Research Group Climate Change and Security)	Paragraph has been deleted in response to this and subsequent reviewers comments
550	56819	12	17	7	17	7	the argument jumps around different forms of violent conflict. The discussion should be more careful in presenting the evidence for climate impacts on specific forms of violent conflict. (Thomas Bernauer, ETH Zurich)	Paragraph has been deleted in response to this and subsequent reviewers comments
551	66781	12	17	9	17	9	'per capita' should be in italics. (Peter Burt, University of Greenwich)	Paragraph has been deleted in response to this and subsequent reviewers comments
552	62997	12	17	10	0	11	May be true re violent crime, but is there an association between riots and high heat days? I am way out of date with this literature, and perhaps the idea has been debunked, but some decades ago in the psychology or sociology literature a correlation was recognised between extreme heat days and incidence of riots. It might be worth checking this, order to give this sentence more sophistication. I just ran the search terms 'heat waves riots' through Google scholar and had quite a few hits. (page 18, lines 14-18 are an alternate appropriate place for this point). (Helen Ross, The University of Queensland)	Paragraph has been deleted in response to this and subsequent reviewers comments
553	66782	12	17	10	17	10	Insert 'that' after 'identify' (Peter Burt, University of Greenwich)	Paragraph has been deleted in response to this and subsequent reviewers comments
554	73492	12	17	15	0	28	Most literature on this topic does not assert that climate change is the primary driver of civil wars. The literature is usually focused on climate change acting as stress or threat multiplier, increasing the stresses that can increase the probability of conflict. This is an important point about how climate change and human security interacts, and the nuance between the two are underplayed throughout this chapter and should be more clearly articulated. (The link to a study on Somalia Famine showing links to climate change and the nuanced interactions between climate change and unrest <a href="http://www.theprovince.com/business/Climate+change+have+played+role+Somalias+famine+study/8109385/story.html">http://www.theprovince.com/business/Climate+change+have+played+role+Somalias+famine+study/8109385/story.html</a> ). (UNITED STATES OF AMERICA)	Nowhere does the chapter say that climate change is the primary driver of civil wars, the text reflects the nuances in the research identified in this comment. The revised ES summary point on this topic stresses that "there is little agreement about direct causality"
555	60570	12	17	15	17	16	The statement that most of the existing research focuses on climate change and civil war is incorrect, if civil war is defined here as more than 1000 Battle Deaths. Most studies use both 25 (civil conflict) and 1000 (civil war) Battle Deaths. It would be better if the term 'armed conflict' or 'violent conflict' was used instead of 'civil war'. (Vally Koubi, University of Bern)	Agree, we have changed the words to reflect the categories of violence added in the opening paragraph of this section.
556	60571	12	17	17	17	18	Burke et al (2009) is not the only study that examines the relationship between temperature and violent conflict. Devitt & Tol (2012), Theisen et al. (2012), Koubi et al (2012), Miguel et al (2004) also operationalize climate change with temperature. Devitt, Conor and Richard S J Tol, 2012: Civil war, climate change and development: A scenario study for Sub-Saharan Africa. Journal of Peace Research 49(1): 129-145 (Vally Koubi, University of Bern)	Sources except Devitt and Tol have been read and cited. And sentence(s) have been rewritten.
557	56962	12	17	17	17	19	Burke et al. (2009) do not only "examine", but (and that is more relevant, I guess) support the link between warming and violent conflict. (Tobias Ide, Research Group Climate Change and Security)	Sentence(s) have been rewritten.

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
558	56820	12	17	19	17	19	see also Koubi et al. in JPR, which shows that not even an indirect effect exists. The other studies all focus on direct effects (which are theoretically very unlikely with a view to what the environmental security literature tells us. (Thomas Bernauer, ETH Zurich)	Sentence(s) have been rewritten.
559	58700	12	17	20	0	0	The significance of Hisang et al. (2011) lies precisely in the fact that, while most other literature on climate change and violent conflict deals with short-term cataclysmic episodes rather than chronic stressors, i.e. is about weather rather than climate change proper, this article looks at a systematic pattern of multiannual climatic changes. The same is even more true about the piece by Zhang et al. (2011), which is cited in your reference list. It is true that in Zhang et al. (2011) there are serious data limitations, but the piece is as good as it gets if you want to study a real proxy for climate change rather than trying to make extrapolations from cataclysmic local episodes. Also have a look at the previous piece by Zhang et al: Zhang, David D., Peter Brecke, Harry F. Lee, Yuan-Qing He, and Jane Zhang (2007) Global climate change, war, and population decline in recent human history, PNAS 104 (49): 19214-19219. (Joerg Friedrichs, University of Oxford)	Sentence has been rewritten to reflect this.
560	66783	12	17	20	17	21	This does not make sense. There are global teleconnections to ENSO for almost all countries,. Please check the sense of what you are trying to say. (Peter Burt, University of Greenwich)	Sentence has been rewritten.
561	56963	12	17	21	17	23	The studies of Hendrix/Salehyan (2012) and Raleigh/Kniveton (2012) also confirm at link between rainfall extremes and violent conflict (although not: civil war) and are more up-to-date than the ones of Miguel et al. (2004) and Hendrix/Glaser (2007). I suggest to include them: Hendrix, Cullen/Salehyan, Idean (2012): Climate, Rainfall, and Social Conflict in Africa. In: Journal of Peace research 49(1), 35-50. Raleigh, Clionadh/Kniveton, Dominic (2012): Come Rain or Shine. In: Journal of Peace research 49(1), S. 51-64. (Tobias Ide, Research Group Climate Change and Security)	Citations added.
562	60572	12	17	22	17	23	add reference to Hendrix and Salehyan (2012). (Vally Koubi, University of Bern)	Added
563	73493	12	17	24	0	25	To the sentence, "Examination of individual conflict shows that there is no prospect of identifying specific civil wars as being primarily driven by climate, this does not mean that climate is not a contributing factor to civil war. The sentence should be deleted or citations provided. (UNITED STATES OF AMERICA)	Sentence deleted.
564	56821	12	17	24	17	24	see also Koubi et al. 2012 in JPR (Thomas Bernauer, ETH Zurich)	Amended
565	56964	12	17	25	17	27	Since box 12-5 argues that desertification and increasing aridity was one among several factors relevant in the darfur case (an argument I support), you may write "with no studies concluding that the conflict was MAINLY climate driven". (Tobias Ide, Research Group Climate Change and Security)	Word 'primarily' added.
566	73494	12	17	29	18	7	Box 12-5: This section is unclear. P. 18 line 4 should be changed from "Darfur conflict as being caused by climate change" to something like "Darfur conflict as being aggravated by climate change" and the text on p. 18, lines 4-5 ought to be broguht to the beginning of the box. Additionally, the sentence goes on to claim that "attributing this conflict to climate change masks the culpability of actors and the major drivers of insecurity," but in lines 39-50 on p. 17, two of the six causes of the violence listed are linked to climate (and therefore will/ are being impacted by climate change). The authors ought to carefully choose the language to describe this relationship. The difference between "causing" and "aggravating" or "contributing to" needs to be clarified. Finally, the box itself should be retitled to something like "The multiple causes of conflict in Darfur" (UNITED STATES OF AMERICA)	Box has been changed in various ways to reflect these concerns.
567	58701	12	17	31	18	7	This is another example where you seem to privilege your own critical views without giving a fair hearing to the views criticized. See my related comments on page 15 line 31 to page 16 line 9, and on the chapter as a whole. (Joerg Friedrichs, University of Oxford)	There is no specific suggestion associated with this comment, no changes have been made.
568	56840	12	17	49	17	50	How can desertification be a cause of the Darfur conflict when rainfall had been increasing for almost 20 years before it started in 2003 and the Darfur and the Sahel in general were greening (Kevane and Gray 2009, Olsson 2012 ( <a href="http://www.eoearth.org/article/Greening_of_the_Sahel">http://www.eoearth.org/article/Greening_of_the_Sahel</a> )) (Tor A. Benjaminsen, Norwegian University of Life Sciences)	There is some dispute here, so this bullet point has been deleted.
569	66784	12	17	50	17	50	References should be in chronological order (and alphabetical order in the years). (Peter Burt, University of Greenwich)	The whole chapter has been edited and this has been made consistent throughout.
570	66785	12	17	50	17	50	Move block of references up to line 38, after 'notably'. (Peter Burt, University of Greenwich)	They are OK where they are.



#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
571	78235	12	17	51	0	0	A similar case can be found with the Boko Haram terrorism in Northern Nigeria due, in part, to widespread poverty (Adetoro, 2012) being fuelled by drought and desertification. [Adetoro Rasheed Adenrele. Boko Haram insurgency in Nigeria as a symptom of poverty and political alienation IOSR Journal Of Humanities And Social Science (JHSS) ISSN: 2279-0837, ISBN: 2279-0845. Volume 3, Issue 5 (Nov. - Dec. 2012), PP 00-00 Www.iosrjournals.Org] (Elochukwu Ezenekwe, Nnamdi Azikiwe University )	We are constrained on the page limits and so have been unable to add additional case studies.
572	82572	12	18	9	18	10	It may be clear to more directly indicate the scope of the evidence meant in the sentence. (Katharine Mach, IPCC WGII TSU)	Sentence has been deleted
573	84637	12	18	10	18	10	What level of agreement in calibrated terms is intended here? (Michael Mastrandrea, IPCC WGII TSU)	Sentence has been deleted
574	56965	12	18	10	18	12	It are consistent respectively consolidated institutions (no matter whether they are democratic or autocratic) rather than merely democratic institutions that reduce the risk for violent conflict. From a normative perspective, I would also like to argue for consolidated democratic institutions, but the literature points to consistency rather than democracy as the relevant factor. See, for instance: Hegre, Håvard et al. (2001): Toward a Democratic Civil Peace? In: American Political Science Review 95(1), 33-48. Dixon, Jeffrey (2009): What Causes Civil War? In: International Studies Review 11(4), 707-735. Hegre, Håvard/Sambanis, Nicholas (2006): Sensitivity Ananylsis of Empirical Results on Civil War Onset. In: Journal of Conflict Resolution 50(4), 508-535. (Tobias Ide, Research Group Climate Change and Security)	Text has been changed (and moved to the paragraph before box 12.5)
575	56822	12	18	11	18	11	Also, for two crucial causal pathways the evidence is negative or unclear: climate to conflict via economic crisis, climate to conflict via migration (Thomas Bernauer, ETH Zurich)	Para has been deleted.
576	73495	12	18	14	0	0	Communal violence is not necessarily smaller scale. The authors should consider re-phrasing to "...between climate variability and violent internal conflict between communities (i.e. inter-communal conflict)." (UNITED STATES OF AMERICA)	Now changed to 'non-state' conflicts to be consistent with terminology in the first paragraph of this section
577	56839	12	18	14	18	20	Two of my own publications could also be added to the second list of references here: Benjaminsen, T. A., F. Maganga and J.M. Abdallah. The Kilosa killings: political ecology of a farmer-herder conflict in Tanzania. Development and Change 40 (3): 423-445. and Benjaminsen, T. A. and B. Ba. Farmer-herder conflicts, pastoral marginalization, and corruption: a case study from the inland Niger delta of Mali. The Geographical Journal 175 (1): 71-81. (Tor A. Benjaminsen, Norwegian University of Life Sciences)	References have been added
578	56967	12	18	14	18	20	This paragraph could be longer, since it describes the climate-violence-link on which most research has been conducted yet (small-scale violence in Sub-Saharan African due to rainfall changes) and which also seems to be the most supportive case. However, while authors such as Hendrix/Salehyan (2012) provide support for a scarcity link, Adano et al. (2012) argue for a resource abundance link. This differences are crucial when it comes for general conclusions about climate-conflict-links and recommended policies, but are not discussed at all here. (Tobias Ide, Research Group Climate Change and Security)	The synopses we provide summarises the points made here. There is not sufficient space for a discussion of any specific paper. However additional references have been added.
579	56966	12	18	17	18	19	As far as I know, precisely the attempt to enforce property rights is a driver of (also violent) conflict in contexts where the 'western' concept of property is not widely acknowledged. See, for instance, the literature on land grabbing, land privatization and biofuels/monoculture expansion in Latin Americam, Sub-Saharan Africa or Southeast Asia. Especially in the executive summary, the IPCC WGII should be very careful when dealing with property rights, since they can (dependent on how, by whom and in which context they are introduced/strenghtend) aggravate or reduce the risk for violent conflict. (Tobias Ide, Research Group Climate Change and Security)	Sentence has been rewored
580	60573	12	18	22	18	23	it would be worthwhile to mention 'income' or 'economic growth' here as a climate affected factor that could lead to conflict. (Vally Koubi, University of Bern)	Mentioned later in the paragraph
581	60574	12	18	24	18	28	In light of the recent empirical literature you should also mention political marginalization and grievances as important determinants of civil conflict onset and cite relevant literature (Grievances and political marginalization could also play an important role in the climate change-migration-violent conflict nexus). Buhaug, Halvard, Lars-Erik Cederman & Kristian Skrede Gleditsch (forthcoming) Square pegs in round holes: Inequalities, grievances, and civil war. International Studies Quarterly. Cederman, Lars-Erik, Nils B Weidman and Kristian Skrede Gleditsch, 2011: Horizontal inequalities and ethonationalist civil war: A global comparison. American Political Science Review 105(3): 478-495. Buhaug, Halvard; Lars-Erik Cederman & Kristian Skrede Gleditsch (forthcoming) Square pegs in round holes: Inequalities, grievances, and civil war. International Studies Quarterly. Buhaug, Halvard, Kristian Skrede Gleditsch, Helge Holtermann, Gudrun Østby and Andreas Forø Tollefsen, 2011: It's the local economy, stupid! Geographic wealth dispersion and conflict outbreak location. Journal of Conflict Resolution 55(5): 814-840. (Vally Koubi, University of Bern)	These are studies from the same group, and emerging, and so there is not a 'strong agreement' about them at this stage.

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
582	84638	12	18	25	18	25	This should be "high agreement" rather than strong, in calibrated terms. (Michael Mastrandrea, IPCC WGII TSU)	Amended
583	66786	12	18	26	18	26	'per capita' should be in italics. (Peter Burt, University of Greenwich)	Amended
584	60575	12	18	31	0	0	With the exception of economic conditions, food insecurity, and migration, there are not that many factors that could increase the risk of civil war and are sensitive to climate change. (Vally Koubi, University of Bern)	The synopsis we provide is based on an assessment of multiple studies
585	82573	12	18	31	18	32	The phrase "robust evidence" should be italicized. (Katharine Mach, IPCC WGII TSU)	Sentence has been amended
586	56823	12	18	32	18	32	there is no robust evidence that climate change has a bad effect on economic performance in richer countries (Thomas Bernauer, ETH Zurich)	Sentence has been re-written to reflect comment
587	66787	12	18	32	18	32	'per capita' should be in italics. (Peter Burt, University of Greenwich)	Amended
588	60576	12	18	32	18	34	Given that the findings from statistical studies suggest that a) the effects of climate change on economic growth depend a lot on the climate indicators, and country and time samples used in the econometric analyses, and b) climate change will produce economic winners and losers you should say that 'there exists some evidence' rather than 'there is robust evidence' that climate change will slow rates of economic growth. For example, while Deschenes and Greenstone (2007) report that temperature increases will lead to a 4% (\$1.3 billion in 2000 dollars) increase in annual agricultural sector profits in the USA, Barrios et al (2010) show that climate, measured as changes in country-wide rainfall and temperature, has been a major determinant of agricultural production in Sub-Saharan Africa. In contrast, Non Sub-Saharan Africa countries appear not to be affected by climate in the same manner. Dell, Jones and Olken (2012) show that higher temperatures have large negative effects on growth, but only in poor countries, whereas precipitation has no effect. Finally, even IAM models differ on whether low levels of global warming would have positive or negative global effects. Nordhaus and Boyer (2000) and Mendelsohn et al (2006) show that there are winners (Canada or Siberia) and losers (Africa again). Deschenes, Oliver and Michael Greenstone. 2007; The economic impacts of climate change: evidence from agricultural output and random fluctuations in weather. American Economic Review 97(2): 354-385. Barrios, Salvador, Luisito Bertinelli, and Eric Strobl, 2010: Trends in Rainfall and Economic Growth In Africa: A Neglected Cause of the African Growth Tragedy. Review of Economics and Statistics 92(2): 350-366 Dell, Melissa, Benjamin F. Jones, and Benjamin A. Olken. 2012. "Temperature Shocks and Economic Growth: Evidence from the Last Half Century." American Economic Journal: Macroeconomics, 4(3): 66-95. Mendelsohn, Robert; Ariel Dinar & Larry Williams (2006) The distributional impact of climate change on rich and poor countries. Environment and Development Economics 11(1): 159-178. Nordhaus, William & Joseph Boyer (2000) Warming the World: The Economics of Greenhouse Effect. Cambridge, MA: MIT Press. (Vally Koubi, University of Bern)	Sentence has been re-written
589	66788	12	18	33	18	33	Capital 'C' required for 'chapter' (in this context it is a proper noun and is also in keeping with other usage in the document). (Peter Burt, University of Greenwich)	Amended
590	56824	12	18	34	18	34	what does consistent mean here (Thomas Bernauer, ETH Zurich)	Words have been changed
591	82574	12	18	39	18	39	The phrase "limited evidence" should be italicized. (Katharine Mach, IPCC WGII TSU)	Sentence has been re-written
592	73496	12	18	42	0	50	This finding is contested and an alternative phrasing could be: "However, confident statements about the effects of future changes in climate on violence of any kind are not possible given the absence of generally supported theories and evidence about causality (see Box 12-5)." There are plenty of studies (cited in this chapter - including the Journal of Peace Research Special Issue) showing connections between climate change and violence, and these studies provide compelling evidence that these connections will be important as the climate continues to change. (UNITED STATES OF AMERICA)	The alternative phrasing suggested is the present phrasing. The paragraph is consistent with the idea expressed by the reviewer when it says "there is justifiable common concern that climate change or changes in climate variability increases the risk of armed conflict in certain circumstances".
593	56826	12	18	43	18	43	Should be "Scheffran" (Thomas Bernauer, ETH Zurich)	Amended
594	63270	12	18	43	18	43	"Sceffran" should read "Scheffran" (Christian Webersik, University of Agder)	Amended
595	56825	12	18	43	18	45	which of these factors are sensitive to climate change <sup>1</sup> (Thomas Bernauer, ETH Zurich)	This paragraph is a summary of the section, this issue is explained in the paragraph starting on p 17, line 14.
596	78248	12	18	43	18	47	Correct "Sceffran" and "Sheffran" to "Scheffran" (Jürgen Scheffran, University of Hamburg)	Amended
597	63271	12	18	45	18	45	"change," should read "change." (Christian Webersik, University of Agder)	Amended
598	73497	12	18	47	0	0	Be explicit that "institutions" includes both formal and informal institutions. (UNITED STATES OF AMERICA)	Amended
599	63272	12	18	47	18	47	Sceffran should read "Scheffran" (Christian Webersik, University of Agder)	Amended

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
600	56827	12	18	48	18	48	the language on how certain specific effects are jumps around quite a lot. here it is noconfidence...in other places ... (Thomas Bernauer, ETH Zurich)	We have reviewed this, it seems consistent to us.
601	56828	12	18	48	18	48	Ensure consistent spelling of "Scheffran" (Thomas Bernauer, ETH Zurich)	Amended
602	56968	12	18	48	18	50	In addition to the lack of generally supported theories and evidence about causality, there are also several studies which do not find any significant correlations or connections between environmental changes and violent conflicts. (Tobias Ide, Research Group Climate Change and Security)	These are discussed in earlier paragraphs, and are taken into account in this assessment and the executive summary.
603	77504	12	19	0	0	0	The potential for reactions to climate change on mitigation and adaptation to generate controversy and conflict over resources is apt and important. (Busby Joshua, University of Texas-Austin)	Thanks
604	68179	12	19	0	19	0	The first and second paragraphs of this section are missing the broader context of how human security will be impacted as the world's climate continues to warm. Instead it reads as though renewable energy technologies are overall detrimental to human security while implying that the status quo is preferable. (International Hydropower Association (IHA))	This broader context is established earlier in the chapter, and this section needs to be read in context with the whole chapter.
605	59000	12	19	1	0	0	Given the argument of the prior section, that there is reason to think climate change affects factors known to be associated to civil war, this section should not focus solely on the conflict-enhancing impacts of climate responses, but also acknowledge the potential conflict-reducing aspects of responses (Ken Conca, American University)	This is discussed in section 12.5.4, which is now referred to at the end of this section.
606	56969	12	19	1	19	34	The sub-chapter might benefit from including the article of Tänzler/Maas/Carius (2010): Tänzler, Dennis/Maas, Achim/Carius, Alexander (2010): Climate change adaptation and peace. In: Wiley Interdisciplinary Reviews 1(5), 741-750. (Tobias Ide, Research Group Climate Change and Security)	Added in section 12.5.4
607	63282	12	19	1	19	34	One issue not mentioned explicitly in this section is the insecurity arising from large adaptation projects, for example large dam projects. Earthquake hazard research demonstrates for instance that the 2008 M7.9 Wenchuan earthquake in Sichuan province was likely triggered by local and abnormal mass changes stemming from the sub-surface, in other words the water of a large dam. Klose, Christian D. 2012. "Mechanical and statistical evidence of the causality of human-made mass shifts on the Earth's upper crust and the occurrence of earthquakes." Journal of Seismology 17(1):109-135. (Christian Webersik, University of Agder)	We agree with this point, although thus far there is very little research and evidence to justify a larger discussion of this issue.
608	73498	12	19	1	19	34	Section 12.5.2: The fact that climate change may be used to divert attention from non-climate underlying factors in conflicts (the concluding statement regarding the Darfur conflict on page 18, lines 4-5) or be used to institute action that will aggravate significant inequalities or grievances (page 19, lines 7-16) is an important concept. These points were also made in the recent National Academy of Sciences report "Climate and Social Stress: Implications for Security Analysis" released late 2012 and available at: ( <a href="http://www.nap.edu/catalog.php?record_id=14682">http://www.nap.edu/catalog.php?record_id=14682</a> ). In this NAS report, the author's perceive a great danger if "climate change generally, and water scarcity issues specifically, are taken and 'used' by contending parties to harden their negotiating positions." (page 5-6, NAS report). Likewise, the report raised similar concerns for food access and prices where "climate change impacts are likely to a factor in - or blamed for - food price spikes and food security crises"(page 5-8). (UNITED STATES OF AMERICA)	NAS study has been cited.
609	80212	12	19	1	19	34	12.5.2 climate policy can interrupt incremental adaptation at local levels (Afifi, Tamer, Govil, Radha, Sakdapolrak, Patrick, and Koko Warner.2012.Climate change, vulnerability and human mobility: Perspectives of refugees from the East and Horn of Africa. Report No.1. United Nations University Institute for Environment and Human Security (UNU-EHS). Bonn. notes that climate policy of some governments interrupts spatial and temporal adaptations strategies of pastoralists without (yet) providing alternatives) (Koko Warner, United Nations University - Institute for Environment and Human Security)	The point made reinforces the conclusion drawn and does not alter the sense in any significant way. The grey literature citation has not been included.
610	73499	12	19	3	0	9	This section is good to include and makes a valid point, but overall the chapter is disjointed and should be redeveloped around a central thesis or recognition that at present there are differing perspectives within the community. The section discusses adaptation actions decreasing the number of people who will be displaced (p 14 lines 30-38) (and displaced people would lead to more instability and violence), and then how adaptation can cause violence in itself. There needs to be information included about the relative scale of the violence caused by not adapting vs. adapting. The chapter should be reworked to provide a clear picture as to what is happening so that this document can be used to make decisions for future actions. As it is currently written the chapter is confusing and does not help with decision making, but reworking it to provide a comprehensive overview that includes the quantitative impacts of action or inaction is extremely useful. (UNITED STATES OF AMERICA)	The relative scale of violence cannot be known at this stage. It is unclear what specific changes are being requested here, though we hope that the changes we have made in response to this and other reviews have improved the chapter.

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
611	69165	12	19	3	19	5	While maladaptation is a possible reason for the increased risk of violent conflict, studies cited here do not directly suggest that CC mitigation and adaptation actions CAN decrease the risk of violent conflict. Instead a look into potential interactions would be more valid, for example Christian Parenti in his book "Tropic of Chaos" (Nation Books, 2011) calls for a vision which will incorporate three different aspects (neoliberal restructuring, Cold War militarism and climate change) potentially leading to violent conflict and calls this scheme as "catastrophic convergence". (NETHERLANDS)	There is evidence that climate policy responses do increase the risk of conflict (the Beymer-Farris study), so 'can' seem justified.
612	82575	12	19	5	19	5	Where "evidence" is mentioned, the chapter team should consider using summary terms for evidence (and agreement) to communicate its assessment, following the uncertainties guidance for authors. (Katharine Mach, IPCC WGII TSU)	We have reviewed and amended where appropriate the use of the word 'evidence' throughout the text.
613	73500	12	19	6	0	0	There is a slight contradiction here with a statement made back on page 16 (lines 22 and 23) about the risks of violent conflict breaking out over access to natural resources. The authors should explore a way to align these two statements or make clear differentiation. (UNITED STATES OF AMERICA)	The sentence has been deleted.
614	73501	12	19	7	0	0	Please add "... management institutions are ineffective AND/OR ILLEGITIMATE". (UNITED STATES OF AMERICA)	Suggested words have been added
615	73503	12	19	18	0	21	This study, (Johnstone and Mazo 2011), identifying links between increased biofuels production, food price spikes, and social instability such as riots should also be cited in the above section on violence - not just the section on biofuels. (UNITED STATES OF AMERICA)	It is not clear which above section is being referred to, the study is cited where it seems most appropriate.
616	73502	12	19	18	19	21	It was unclear how this paragraph fit with the overall section on adaptation actions or policy responses. The authors should either delete the biofuels discussion here if it is covered another chapter, or add an opening statement describing how investments in biofuel development is itself an adaptation strategy to climate change and then move to making the points that follow. (UNITED STATES OF AMERICA)	The section is about 'climate policy responses' and not just adaptation, as indicated in the title as well as the opening line of the section.
617	69166	12	19	20	19	21	The claim of the cited reference is that climate change and related food price spikes have acted as a threat multiplier in Arab Spring despite not having a direct causal relations with social upheaval (ie. Arab Spring in this case). While there seems to be a relation, this sentence should be more carefully written to avoid any overgeneralization. See also this piece by Mohtadi (2012) <a href="http://www.thebulletin.org/web-edition/features/climate-change-and-the-syrian-uprising">http://www.thebulletin.org/web-edition/features/climate-change-and-the-syrian-uprising</a> (NETHERLANDS)	Sentence has been altered to reflect this point.
618	73504	12	19	23	19	28	In general there is too little discussion of the potential issues of conflict around REDD+. There is a strong academic literature to draw on as well as grey literature of case studies that show both the potential to reduce future conflict around land tenure (by creating a process to clarify tenure and use rights claims) at the same time there are serious potential that REDD+ can drive conflict. This is made possible through providing opportunities for elite capture that include elites taking advantage of contradictory legal structures. In addition there is various works on the governance of REDD+ finds that there is still insufficient representation and information to indigenous peoples in the REDD+. Also, some case work has found a lack of transparency as well as concerns about issues of corruption and transparency in the global governance of carbon payments. The authors should provide a more complete and robust discussion of REDD+ and include research by Transparency International. (UNITED STATES OF AMERICA)	We have cited the available peer-reviewed literature that examines this issue. A paragraph on this issue is appropriate given the availability of peer-reviewed literature, and the significance of the other risks discussed throughout the chapter.
619	78013	12	19	27	0	28	Eriksen and Lind (2009): no reason(s) been given for statement (Peter Zeil, Center for Geoinformatics Z_GIS Salzburg University)	It is unclear what the suggested change is here.
620	73505	12	19	30	0	34	These studies showing hydropower projects, some of which have historically resulted in social conflict and human insecurity (for example forced resettlement), as a basis for concerns about increased violence and insecurity in the future (Conca 2005; McDonald-Wilmsen et al., 2010; Sherbinin et al. 2011) should also be included in the earlier sections of the chapter looking at violence, historical conflict patterns as indicators of potential future conflict. (UNITED STATES OF AMERICA)	Hydropower projects are only one of many drivers of human insecurity and conflict that could be discussed in greater detail in the chapter, but we have had to restrict ourselves to a discussion of the peer-reviewed literature that examines the direct and indirect associations between climate change and human insecurity, and so the reference to hydropower projects is most appropriate in this section.
621	68180	12	19	30	19	33	In the past, dams have had resettlements that have caused harm to the people, but this section reads as though the wider global or regional population will suffer from more insecurity. Also, there's no basis to make a projection on future behaviour based on isolated cases from long ago. (International Hydropower Association (IHA))	The language we use is .."some of which..." and "this is a basis for concerns...", which is appropriate.

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
622	73506	12	19	33	19	34	If the authors are going to include this sentence on a nuclear power potentially leading to nuclear proliferation/terrorism then it needs more than one sentence of discussion and more cited evidence. (UNITED STATES OF AMERICA)	Sentence has been slightly modified and an additional source (the NAS study) cited.
623	66789	12	19	40	19	40	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
624	66790	12	19	41	19	41	Delete comma after 'communities'. (Peter Burt, University of Greenwich)	Amended
625	73507	12	19	42	19	52	Statistics from the 2009 UNEP report "From Conflict to Peacebuilding: the Role of Natural Resources and the Environment" help support the argument regarding the effects of conflict on population resilience. In this report, "conflicts associated with natural resources are twice as likely to relapse into conflict in the first five years." However, "fewer than a quarter of peace negotiations aiming to resolve conflicts linked to natural resources have addressed resource management mechanisms." The authors should reflect these findings accordingly. (UNITED STATES OF AMERICA)	The sentence is about the effects of violence on human security, the suggested reference and point is slightly tangential to this point.
626	82576	12	19	43	19	43	Casual usage of the term "likely" should be avoided as it is a reserved likelihood term in the uncertainties guidance for authors. (Katharine Mach, IPCC WGII TSU)	Sentence has been changed
627	81414	12	19	43	19	45	"where violent conflict emerges and persists, capacity to adapt to climate change is likely to be low (as illustrated in Figure 12-2)." Currently the way Figure 12-2 and its caption are presented, I do not see how the statement is depicted in the figure. Since the figure does not show the direct correlation of the two elements, perhaps, it is more appropriate to insert this figure later in the section. (Yuka Estrada, IPCC WGII TSU)	A better explanation has been offered in the text.
628	73508	12	19	51	19	51	There is some evidence that violent conflict degrades the quantity and quality of natural resources. This sentence needs to be reframed to include a subject. It's not clear what this part of the sentence is trying to say in any case. Is there an example that could be provided? (UNITED STATES OF AMERICA)	The wording has been changed.
629	82577	12	19	51	19	51	Where "some evidence" is mentioned, the chapter team should consider using summary terms for evidence (and agreements) to communicate its assessment, following the uncertainties guidance for authors. (Katharine Mach, IPCC WGII TSU)	The wording has been changed.
630	73509	12	19	51	20	2	Again, the result can also be one of abundance and that can equally cause tension over access as well. Evidence from northern Uganda (LRA conflict) and the DRC (second Congo War beginning in 1998) demonstrates that certain tracks of valuable forest in fact regenerated, and in Sudan migratory white-eared kob in the Boma-Jonglei Landscape multiplied, while populations were displaced and the areas were inaccessible to commercial exploitation due to security concerns during the conflict. (UNITED STATES OF AMERICA)	This is implied with the use of the words access and 'abundance', note we do not say the issue is simply one of scarcity.
631	66791	12	19	52	19	52	Insert comma after 'example'. (Peter Burt, University of Greenwich)	Amended
632	66792	12	19	53	19	53	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
633	66793	12	20	2	20	2	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
634	61318	12	20	4	20	8	Consider including the example of Palestinian communities that are cut off from their agricultural land by the concrete security wall constructed by the Israelis. (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	We are constrained on the page limits and so have been unable to add additional case studies.
635	66794	12	20	12	20	12	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
636	66795	12	20	14	20	14	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
637	66796	12	20	15	20	15	Insert comma after 'Thus'. (Peter Burt, University of Greenwich)	Amended
638	66797	12	20	19	20	19	Reference style needs correcting (Peter Burt, University of Greenwich)	Amended
639	73510	12	20	19	20	21	We recommend providing specific examples of what capacities are in fact degraded by conflict that are critical for coping with climate impacts. Are the authors referring to things like social cohesion and trust? If so, I suggest making this explicit. (UNITED STATES OF AMERICA)	Sentence is now more specific.
640	66798	12	20	21	20	21	Reference style needs correcting (Peter Burt, University of Greenwich)	Amended
641	73511	12	20	22	20	24	The sentence here appears cut off, ending with "may compound divisions where such efforts." Was there further discussion or examples to include in this paragraph? (UNITED STATES OF AMERICA)	Sentence is now complete
642	78014	12	20	23	0	0	incomplete sentence (Peter Zeil, Center for Geoinformatics Z_GIS Salzburg University )	Sentence is now complete
643	66799	12	20	23	20	23	Text missing (Peter Burt, University of Greenwich)	Sentence is now complete
644	59011	12	20	26	20	26	The statement that conflict-related displacement leads to social isolation should be reworded: it is not so much social isolation (e.g. many displaced to crowded camps/urban settlements) but rather disruption of social networks. (Celia McMichael, La Trobe University)	Sentence has been changed, and moved into previous paragraph

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
645	78015	12	20	28	0	0	instead of 'times of vulnerability' better 'in times of exposure' ? (Peter Zeil, Center for Geoinformatics Z_GIS Salzburg University )	'Times of vulnerability' has been removed.
646	61319	12	20	31	20	38	Some of the selected citations seem awkward. For example, the general references to illustrate how violent conflict can decrease local/state capacity to function effectively: There is the case of Palestine in 12.5.3, yet Palestine has witnessed far more than "urban land use" disruption due to violent conflict. To be sure, there is reference to water management disruption in the Gaza Strip ("conflict has reduced the ability of governance institutions") but there is no attempt to define what is meant here by "governance institutions", especially in this particular context. In other words, it is not clear how and why selective (and seemingly random) citations find their way in what is a dense or charged topic/section that often strays from the climate change focus. (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	The paragraph has been more explicitly linked to climate change - the point is that violence undermines the capacity of governments to implement adaptation.
647	66800	12	20	31	20	38	Not clear what this block of text has to do with climate change per se. (Peter Burt, University of Greenwich)	This has been explained with an addition to the opening sentence
648	56829	12	20	33	20	33	note research published by Beck and Bernauer on the Zambezi (in GEC) and work by Siegfried an Bernauer (published in Climatic Change) showing that long term management deficiencies can undermine resilience to climate change (Thomas Bernauer, ETH Zurich)	The sentences and paragraph are about the effects of violent conflict on adaptation, these references are not about the effects of violent conflict on adaptation.
649	66801	12	20	34	20	34	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
650	66802	12	20	34	20	34	Change 'process' to 'processes'. (Peter Burt, University of Greenwich)	Amended
651	66803	12	20	35	20	35	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
652	66804	12	20	37	20	37	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
653	73512	12	20	43	0	0	Please consider adding: and potentially highlights government ineffectiveness or illegitimacy in the eyes of certain aggrieved identity groups. (UNITED STATES OF AMERICA)	The suggested addition doesn't change the meaning, and for reasons of brevity has not been added.
654	63289	12	20	46	21	13	There is also a body of literature on disaster diplomacy which could be included here though this research does not directly relate to adaptation. For instance, disaster relief activities can trigger diplomatic relations and bring former enemies together, or more generally how and why disaster activities affect peace and security. Kelman, Ilan. 2012. Disaster diplomacy. Milton Park, Abingdon, Oxon. [England]; New York: Routledge. (Christian Webersik, University of Agder)	As noted, this is a slightly tangential issue, and for reasons of space constraints we have not added a discussion on this issue.
655	63281	12	20	48	20	52	The following publications (2 out of 6 to be published) is part of a global initiative led by the Environmental Law Institute (ELI), the United Nations Environment Programme (UNEP), the University of Tokyo, and McGill University to identify and analyze lessons in natural resource management and post-conflict peacebuilding, and could be included here: (1) Aas Rustad, Siri Camilla and Päivi Lujala. 2011. High-value natural resources and post-conflict peacebuilding. New York, NY: Earthscan. (2) Jensen, David and Stephen C. Lonergan. 2012. Assessing and restoring natural resources in post-conflict peacebuilding. Milton Park, Abingdon, Oxon; New York: Earthscan. (Christian Webersik, University of Agder)	Good suggestions, these have been added.
656	77501	12	21	0	0	0	The emphasis on the ways in which disputes over water have been resolved largely peacefully is valid. (Busby Joshua, University of Texas-Austin)	Thanks
657	77502	12	21	0	0	0	It would be helpful in the chapter on human security to discuss the regional distribution of relative vulnerabilities based on the confluence of physical exposure, demographics, social aspects at household and community level, and governance. Is Africa more vulnerable than Asia? To what? Why? (Busby Joshua, University of Texas-Austin)	This would require significant new analysis, which is beyond the remit of the IPCC in this instance. At present there is not consistent information about any of the possible metrics for comparison to enable us to do this.
658	77503	12	21	0	0	0	The section on the national security dimensions of climate change is important, but it would be helpful to have some discussion in the conceptual material up front about how to think about the difference between individual level human security and state-based concerns about survival of the state, inter-state borders, critical infrastructure. The Busby 2008 Security Studies paper has a detailed discussion of the conditions under which climate change could effect a country's national security, largely consistent with the discussion in this section. (Busby Joshua, University of Texas-Austin)	Good poimnt. Section 1 now is more explicit about the justification for this section and reference is made to the Gilman et al (Oxford Handbook chapter) and to Busby's articulation of the role of national security in human security
659	84639	12	21	1	21	7	This paragraph overlaps with the paragraph on p. 23 l. 12-21. (Michael Mastrandrea, IPCC WGII TSU)	Noted, the change has been made in section 12.6 to avoid duplication.
660	56830	12	21	3	21	3	See review of the existing literature by Bernauer and Kalbhenn (ISA Compendium) (Thomas Bernauer, ETH Zurich)	No change has been made.

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661	66805	12	21	3	21	3	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
662	73513	12	21	9	0	0	There is in fact a reasonable body of evidence around natural resource management efforts, other than water, that have resulted in improved governance and reduced conflict, providing lessons for how climate change approaches should be tailored. See (for example): "Livelihoods, Natural Resources, and Post-Conflict Peacebuilding", Edited by Helen Young, Lisa Goldman. To Be Published September 30th 2013 by Routledge. "Strengthening Post-Conflict Security and Diplomacy: Integrating Natural Resource Management and Infrastructure Redevelopment into U.S. and Japanese Peacebuilding Initiatives". Available at <a href="http://www.eli.org/Program_Areas/SPCSD/research.cfm">http://www.eli.org/Program_Areas/SPCSD/research.cfm</a> . Lynch, O. J.; Talbott, K. "Balancing acts: community-based forest management and national law in Asia and the Pacific". 1995 pp. xvi + 188 pp. (UNITED STATES OF AMERICA)	The point is taken, we have been unable to read these suggested references and so have not cited them, but two volumes in the same series as the Young and Goldman volume have been read and cited, and the sentence amended accordingly.
663	56970	12	21	9	21	13	Next to water and peace parks, there exists also the form of cooperation known in the literature as disaster diplomacy. See, for instance: Ganapati/Kelmann/Koukis (2010): Analyzing Greek-Turkish Disaster-Related Cooperation. In: Cooperation and Conflict 45(2), 162-185. Kingsbury (2007): Peace Processes in Aceh and Sri Lanka: A Comparative Assessment. In: Security Challenges 3 (2), 93-112. Kreuz (2012): Do Natural Disasters Produce Ripe Moments for Resolving Separatist Conflicts? In: International Interactions 38(4), 482-502. (Tobias Ide, Research Group Climate Change and Security)	This is slightly tangential, and for space reasons has not been included.
664	62283	12	21	16	21	16	Please insert here a discussion on the international security dimension on climate change and condense the section on the national security dimension of climate change that is only slightly linked to the theme of this chapter on human security and climate change. Section 12.6 may be renamed as. International and National Security Dimensions. To totally ignore the role of international organizations and the international security dimension of climate change and both their contribution to the policy debate and the peer reviewed scientific literature on their specific contributions misrepresents the scientific debate this chapter should assess. (Hans Guenter Brauch, Free University of Berlin)	We have considered the suggestion, but chosen not to make structural changes to this section. We sought to balance national and international security dynamics in this section, and think the existing treatment meets this goal.
665	58702	12	21	16	23	34	While I understand your uneasiness with the more hard-nose geopolitical and security literature, you should nevertheless give it some space. In an IPCC report, you need to present the state of the art and give a fair hearing to all relevant literatures. Here are just a few references for consideration: CNA Corporation (2007) National Security and the Threat of Climate Change, Alexandria, VA: CNA Corporation; WBGU (2008) Climate Change as a Security Risk, London: Earthscan and German Advisory Council on Global Change (WBGU); Campbell, Kurt M. (ed.) (2008) Climate Cataclysm: The Foreign Policy and National Security Implications of Climate Change, Washington, DC: Brookings Institution Press; Herman Jr., Paul F. and Gregory F. Treverton (2009) The Political Consequences of Climate Change, Survival 51 (2): 137-148; Smith, Kerri (2011) We are seven billion, Nature Climate Change 1: 331-335. (Joerg Friedrichs, University of Oxford)	We have added references to Herman and Treverton, which in turn has a good bibliography citing other literature cited in this comment; and to the US NRC 2012 study that represents one of the more recent examples of this type of report. We have slightly augmented the opening paragraph.
666	66806	12	21	22	21	22	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
667	73514	12	21	27	0	34	Increased risk of forest fires should also be mentioned. (UNITED STATES OF AMERICA)	We have included mention of forest fires and added a suitable reference.
668	80103	12	21	27	21	28	"Climate change..." Add ICT as another critical infrastructures, modern societies (also developing countries) increasingly dependant in many aspects of ICT, the interconnections being strong and transferring CC risks between infrastructures (Mikko Halonen, Gaia Consulting Oy)	We have made the suggestGood point - no literature specifically on this point, so not included.ed change. ICT HAS NOT BEEN ADDED
669	66807	12	21	28	21	28	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
670	63279	12	21	29	21	32	Insert more on critical infrastructure: ..and the shutdown of critical infrastructure, such as sea ports (Esteban, Miguel, Christian Webersik and Tomoya Shibayama. 2010. "Methodology for the Estimation of the Increase in Time Loss due to Future Increase in Tropical Cyclone Intensity in Japan." Climatic Change 102(3-4).) (Christian Webersik, University of Agder)	Detailed treatment of infrastructure threats is found elsewhere in AR5. For space reasons we cannot go into more depth here.
671	66808	12	21	33	21	33	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended.
672	78234	12	21	35	0	0	Erosion in south eastern Nigeria have gullied away rail lines and taken great toll on access roads and electricity infrastructure, thereby cutting off rural areas served by this infrastructure and exacerbating poverty (Nwilo et al., 2011) [Peter Chigozie NWILO, Dupe Nihinlola OLAYINKA, Ibeabuchi UWADIEGWU, Ayila Emmanuel ADZANDEH. An Assessment and Mapping of Gully Erosion Hazards in Abia State: A GIS Approach Journal of Sustainable Development Vol. 4, No.5; October 2011] (Elochukwu Ezenekwe, Nnamdi Azikiwe University )	We have decided not incorporate this example for space reasons. Detailed treatment of infrastructure threats is found elsewhere in AR5.
673	66809	12	21	40	21	40	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
674	73515	12	21	42	0	0	"but affect the whole" should be "but also will affect the whole" (UNITED STATES OF AMERICA)	Amended

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675	71353	12	21	42	43	0	Suggest clarifying that thawing permafrost will affect water infrastructure affect the viability of settlements as described in Dersken, Smith et al 2012 (Climatic Change, vol 115) (CANADA)	We have clarified the sentence as suggested.
676	66810	12	21	43	21	43	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
677	73516	12	21	45	21	46	The last sentence on this paragraph lacks proper context. Please add it. (UNITED STATES OF AMERICA)	We have clarified the context.
678	66811	12	21	46	21	46	Change 'Ethiopia' to 'Ethiopia's'. (Peter Burt, University of Greenwich)	The correction has been made.
679	66812	12	22	2	22	2	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
680	73517	12	22	4	0	13	It should be mentioned that with sea level rise the current boundaries of the EEZs (exclusive economic zones) may shift, which may lead to conflicts over natural resources or boundary disputes. (UNITED STATES OF AMERICA)	The suggestion has been adopted
681	66813	12	22	4	22	4	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
682	62284	12	22	4	22	11	The challenge climate change may pose to the sovereignty to Small Islands States, particularly in the Pacific, should be enlarged, see e.g. the two peer-reviewed book chapters by Kinnas, Yannis N, 2009: "Human Security, Climate Change and Small Islands", in: Brauch, Hans Günter, et al.: Facing Global Environmental Change: Environmental, Human, Energy, Food, Health and Water Security Concepts, Berlin et al. : Springer-Verlag, pp. 131-139 and Achim Maas; Alexander Carius: "Territorial Integrity and Sovereignty: Climate Change and Security in the Pacific and Beyond", in: Scheffran 2012a, pp. 651-665. (Hans Guenter Brauch, Free University of Berlin)	We have chosen not to expand the discussion of small island states. We believe the existing treatment is adequate, and we have space constraints.
683	56841	12	22	5	22	5	Due to tectonic activity, the sea level on the Tanzanian coast does not seem to be rising. The land mass is instead rising. See eg Kebede and Nicholls (2011). (Tor A. Benjaminsen, Norwegian University of Life Sciences)	Good point. The sentence has been amended to reflect this empirical observation
684	66814	12	22	7	22	7	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
685	73518	12	22	10	0	11	Please add a reference that the physical integrity of low lying islands is under threat and is relevant to state sovereignty. (Jon Barnett, Adapting to Climate Change in Pacific Island Countries: The Problem of Uncertainty, World Development, Volume 29, Issue 6, June 2001, Pages 977-993, ISSN 0305-750X, 10.1016/S0305-750X(01)00022-5. ( <a href="http://www.sciencedirect.com/science/article/pii/S0305750X01000225">http://www.sciencedirect.com/science/article/pii/S0305750X01000225</a> ) (UNITED STATES OF AMERICA)	Alternative and more recent Barnett and Adger cite added in support of suggestion made in this comment.
686	66815	12	22	11	22	11	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
687	58703	12	22	15	22	20	The discussion of fisheries may fit better under the rubric or livelihoods (12.2) rather than geopolitical issues. (Joerg Friedrichs, University of Oxford)	We have sharpened the language to make clear that our purpose is to draw attention to prospects for increased geopolitical tension stemming from movement of fish stocks.
688	82578	12	22	15	22	20	The chapter team should cross-reference specific findings and sections of chapter 6 and 30 in support of these statements, ensuring consistency with the conclusions of those chapters. (Katharine Mach, IPCC WGII TSU)	We have reviewed chapters 6 and 30. Our treatment is consistent with what is reported there, though 6 and 30 understandably have more detail.
689	66816	12	22	17	22	17	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
690	66817	12	22	17	22	17	Insert comma after 'activity' (Peter Burt, University of Greenwich)	Amended
691	61320	12	22	17	22	20	Another example would be mackerel or herring stocks shifting further north in Europe outside of EU waters and conflicts between other parties to shared stock agreements over management and how much catch should be allowed. For example: Climate change impacts on the biophysics and economics of world fisheries. U. Rashid Sumaila, William W. L. Cheung, Vicky W. Y. Lam, Daniel Pauly & Samuel Herrick Nature Climate Change 1, 449–456 (2011) doi:10.1038/nclimate1301 (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	This suggestion has been incorporated.
692	66818	12	22	18	22	18	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
693	66819	12	22	19	22	19	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
694	66820	12	22	27	22	27	Change 'System wide' to 'System-wide'. (Peter Burt, University of Greenwich)	Amended
695	66821	12	22	28	22	28	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
696	80104	12	22	30	22	32	add into sentence also reference to mineral resources (Mikko Halonen, Gaia Consulting Oy)	Sentence has been clarified in context of paragraph, but have decided meaning clear without specific reference to mineral resources.
697	66822	12	22	34	22	34	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended



#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
698	82579	12	22	34	22	37	Relevant findings from the Working Group I contribution should be cross-referenced here. Additionally, specific cross-reference to relevant sections of Chapter 28 would be preferable. (Katharine Mach, IPCC WGII TSU)	We have made more direct references to chapter 28, which in turn has strong references to WGI.
699	66823	12	22	36	22	36	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
700	66824	12	22	37	22	37	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
701	73519	12	22	39	0	43	The Arctic Council, as part of its mandate, does not discuss national security issues and it is unclear if additional governance structures will be needed for security issues in the future. Authors should include this perspective as well, and coordinate with Arctic chapter for consistency (EBINGER, C. K. and ZAMBETAKIS, E. (2009), The geopolitics of Arctic melt. International Affairs, 85: 1215, 232. doi: 10.1111/j.1468-2346.2009.00858.x) (UNITED STATES OF AMERICA)	This issue is addressed in the rewrite and reference is included
702	66825	12	22	39	22	39	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
703	66826	12	22	40	22	40	Insert comma after first 'Young' reference. If these are the same author, the second 'Young' can be deleted. (Peter Burt, University of Greenwich)	Amended
704	62285	12	22	47	23	21	The role of transboundary water basins has recently been reviewed by in the chapter on water in UNEP's GEO 6 that was published in June 2012. The section on research on transboundary conflict and cooperation ignores recent peer reviewed book chapters by: Aydin/Ereker, 2009; Hayek, 2009; Selby, 2009; Jägerskop, 2009; Adly/Ahmed 2009, Kameri-Mbote/Kindiki, 2009, Ashton/Turton, 2009; Kipping 2009, 2009a; Lindemann, 2009; Borghese, 2009; Tignino, 2009 all: in Brauch et al. 2009. The chapter cites much older literature Mc Caffey, 2000; Sadoff/Grey /2002, Conca 2002. Again authors from outside OECD countries are underrepresented. (Hans Guenter Brauch, Free University of Berlin)	We have consolidated the discussion of transboundary water issues, and the resulting discussion in section 6 now has more references that are more recent.
705	69167	12	22	48	22	50	Two important crossboundary river basins which cut across a tense region are not included. These are namely Tigris and Euphrates. (NETHERLANDS)	We have added Tigris and Euphrates.
706	66827	12	22	49	22	49	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
707	82580	12	22	50	22	51	Relevant citations and/or cross-references in clear support of this statement are needed. (Katharine Mach, IPCC WGII TSU)	Two citations added
708	63273	12	22	50	22	52	Do you have sources to support this claim? (Christian Webersik, University of Agder)	Two citations added
709	63280	12	22	50	22	52	The sentence starting with "Climate change...increased populations." could be supported with a source if possible. (Christian Webersik, University of Agder)	Two citations added
710	73520	12	22	50	22	52	This section contradicts the assertion previously made on p. 16 lines 47-48. This chapter needs to be consistent in its arguments and main thesis. (UNITED STATES OF AMERICA)	We have consolidated the transboundary water discussion so as to more clearly reflect the fact that while most historical studies identify a generalization that transboundary water conflicts do not become violent, nevertheless the magnitude of some projected changes are generating concern.
711	84640	12	22	50	22	52	Please cross-reference Chapter 3 and consider the characterization of this topic in that chapter. (Michael Mastrandrea, IPCC WGII TSU)	We have included direct links to chapter 3.
712	66828	12	23	2	23	2	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
713	66829	12	23	4	23	4	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
714	66830	12	23	5	23	5	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
715	66831	12	23	8	23	8	Change 'emphasize' to 'emphasizes'. (Peter Burt, University of Greenwich)	Amended
716	73521	12	23	8	23	8	Emphasize should be emphasizes. (UNITED STATES OF AMERICA)	Amended
717	66832	12	23	10	23	10	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
718	84641	12	23	12	23	21	This paragraph overlaps with the paragraph on p. 21 l. 1-7. (Michael Mastrandrea, IPCC WGII TSU)	We have removed the redundant language from section 6.
719	66833	12	23	14	23	14	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended.

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
720	73522	12	23	14	23	17	This section contradicts the assertion previously made on p. 16 lines 47-48. This chapter needs to be consistent in its arguments and main thesis. (UNITED STATES OF AMERICA)	We have consolidated the transboundary water discussion so as to more clearly reflect the fact that while most historical studies identify a generalization that transboundary water conflicts do not become violent, nevertheless the magnitude of some projected changes are generating concern.
721	66834	12	23	15	23	15	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
722	63600	12	23	23	23	23	Wording implies that Geoengineering technologies are already at hand. Please reformulate, e.g.: "Geoengineering – c o n c e p t s o f intentional large-scale interventions..." (GERMANY)	We have added text to address this comment.
723	66835	12	23	23	23	23	Capital 'S' required for 'Sun' (proper noun in this context, and as used elsewhere). (Peter Burt, University of Greenwich)	Amended
724	63601	12	23	23	23	24	Doesn't SRM aim at reducing the short-wave solar radiation input, enhancing its reflection, or at increasing the long-wave thermal radiation to space?; and doesn't CDR aim at reducing/extracting CO2 in/from the atmosphere?; Please reformulate. (GERMANY)	We have made the definition more general to avoid confusion.
725	82581	12	23	23	23	25	Cross-references to relevant chapters in working groups 1 and 3 could be provided, along with specific cross-reference to relevant sections of chapter 20. (Katharine Mach, IPCC WGII TSU)	We think the existing reference to chapter 20 is sufficient for this chapter -- more detail in a human security chapter is not warranted, in part because of space constraints and the relatively low weight given to geoengineering in the chapter as a whole.
726	62286	12	23	23	23	34	The paragraph on geoengineering may not be relevant for a discussion of human security and climate change. (Hans Guenter Brauch, Free University of Berlin)	We include geoengineering because the literature contains discussion of geoengineering in the context of geopolitical, climate, and security intersections.
727	66836	12	23	24	23	24	Capital 'E' required for 'Earth' (proper noun in this context, and as used elsewhere). (Peter Burt, University of Greenwich)	This correction has been made.
728	63602	12	23	24	23	25	Please consider the large uncertainties attached to geoengineering and reformulate, e.g.: "...is increasingly considered a p o t e n t i a l strategy to address...". (GERMANY)	We inserted text to address this comment.
729	66837	12	23	28	23	28	Split infinitive: move 'unilaterally' to after 'geoengineering'. (Peter Burt, University of Greenwich)	This correction has been made.
730	73523	12	23	29	23	34	The authors should be clear that the military is also involved in other aspects of climate adaptation and disaster risk reduction, so it is unclear why the only mention of it is in the geoengineering section, and specifically characterized as securitization, as opposed to a broader definition of human security being incorporated into military strategy (which is often the case). (UNITED STATES OF AMERICA)	The comment is absolutely correct that militaries are playing a multiplicity of roles in climate mitigation and adaptation. This particular section however focuses on geopolitical considerations and geoengineering in particular. The text has been revised to narrow the focus to geoengineering rather than wider climate responses that are more diverse and to distinguish this discussion from wider securitization debates.
731	57502	12	23	30	23	34	There is no connection between "climate geoengineering" and "1977 UN Convention on the Prohibition of Military and Any Other Hostile Use of Environmental Modification Techniques". The key words here are "Military and Any Other Hostile". Geoengineering technics do not intend any actions which can be considered as "military" and "hostile". In line 33 a reference is given to (Keith, 2000). Let us note that D.W.Keith did not connect directly "geoengineering" and the Convention in the cited publication. (Alexey Ryaboshapko, Institute of Global Climate and Ecology)	The intent of the original text is to point out that there are concerns that geoengineering technology could potentially be used for hostile purposes. This point is valid, and supported by the references, including Keith 2000. There may be some ambiguity stemming from the term "dual use." We have dropped this term and clarified our point with more direct language.
732	66838	12	23	30	23	34	This sentence does not make sense, and there are referencing issues! (Peter Burt, University of Greenwich)	Text has been significantly revised for precision and clarity.
733	69168	12	23	30	23	34	Here a key reference is omitted. Simon Dalby in his book Security and Environmental Change (Polity Press, 2009) explains the securitization of climate change in detail in section 2. (NETHERLANDS)	A new 2013 Dalby contribution to the literature specifically focused on geoengineering has been added to the paragraph.
734	78246	12	23	31	0	0	The missing reference is: Brzoska, M., Link, P.M., Maas, A. & Scheffran, J. (eds.) (2012): Geoengineering: An Issue for Peace and Security Studies?, Sicherheit & Frieden / Security & Peace, Special Issue, 30 (4/2012). Individual articles from this special issue may be also relevant here. (Jürgen Scheffran, University of Hamburg)	Citation added in reference list .

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
735	63603	12	23	31	23	32	Please consider the large uncertainties attached to geoengineering. You might want to use a wording that includes other kinds of concern (potentially unknown at present time). Please reformulate, e.g.: "...but in the case of geoengineering, concern stems, in t e r a l i a, from possible dual use ...". (GERMANY)	Text in the paragraph was revised to address this comment and other parts of the referred to text was deleted.
736	59001	12	23	37	0	0	The conclusion could usefully summarize some of the principal uncertainties in knowledge about the links between climate change and human security (Ken Conca, American University)	Good point. Clarified in Box 12.2 and in concluding paragraphs
737	58265	12	23	37	25	7	This part list the examples mainly, but lack of concise.This part should put out the main conclusions of this chapter. (Juqi Duan, National Climate Center, Chinese Meteorological Administration)	Amendments have attempted to increase clarity and brevity but we have retained examples
738	62287	12	23	37	25	7	The section 12.7 synthesis may need some revisions, The peer-reviewed literature on the impact of climate change on food security lacks any reference to the climate-indudec decline in food production as argued in WBGU, 2008: World in Transition – Climate Change as a Security Risk (London: Earthscan); at: <http://www.wbgu.de/wbgu_jg2007_engl.html >.: and by Steffen Bauer, 2011: Stormy weather. Internatinal security in the shadow of cliamte change", in: Brauch et al. 2011, pp. 719-733. (Hans Guenter Brauch, Free University of Berlin)	The issue of food security now strengthened in Section 2.
739	62289	12	23	37	27	7	The concluding chapter does not discuss the relationship of human security to international and national security but also the relationshop of human security with severral related sectoral security concepts, e.g. water, soil, food, health and livelihood security that are briefly noted throughout the chapter. (Hans Guenter Brauch, Free University of Berlin)	The new table and explanation around Figure 12.3 clarifies the scope of the chapter
740	82582	12	23	40	23	41	The phrase "high agreement" should be italicized. (Katharine Mach, IPCC WGII TSU)	Amended
741	56842	12	23	43	23	43	Are farmers in the Sahel in general concerned about the risks of climate change? Have farmers in the Sahel at all heard about global climate change? They probably have other much more tangible concerns. (Tor A. Benjaminsen, Norwegian University of Life Sciences)	The statement cites the study by Mertz that documented perceptions of risk around climate variability. The point of the sentence is that their values, risks and dimensions of human security are different to those of other actors and organisations in different circumstances and in different parts of the world
742	61321	12	23	44	23	45	The Synthesis in 12.7 refers to people in Tuvalu repoting that the cultural impacts of migration are a primary concern. However, this seems misleading because the reader might (rightly) be thinking of climate-induced migration, and yet the link between climate change and migration for the case of Tuvalu seemed to have been negated in the migration section of the chapter. (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	The point of the sentence is that their values, risks and dimensions of human security are diffierent to those of other actors and organisations in different circumstances and in different parts of the world. The wording is clear in that it refers to migration not climate-induced migration. Sentence amended for further clarification
743	70560	12	23	45	23	49	The United Nations University Institute for Environment and Human Security (UNU-EHS) conducts research on the impacts of major drivers affecting human security, such as rapid- and gradual-onset environmental change – including climate change. (Andrea Milan, United Nations University Institute for Environment and Human Security)	Thank you for that statement. Many papers by UNUI EHS authors are referred to where appropriate
744	73524	12	23	45	23	51	This discussion on institutitional mandates doesn't really fit with the rest of the paragraph--expand or just delete it here. (UNITED STATES OF AMERICA)	These are examples of how framing matters and are simply reporting that different organisations have different emphases as evidence for that statement. It is not making any assessment of whether the framing and emphasis are positive or negative.
745	61322	12	23	49	23	51	The Synthesis says that framing CC as a human security issue facilitates conversations between different policy communities. But perhaps a better word than "facilitates" is "enables", because that conversation is too complex to benefit from "facilitation" by what is simply a conceptual twist (use of the broad term "human security" as opposed to, say, "development"). (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	Good point - text amended to reflect suggestion
746	84642	12	24	3	24	10	The figure does not really show these interactions explicitly, and it would be very useful to devise a way to illustrate these cascading interactions. (Michael Mastrandrea, IPCC WGII TSU)	Good point. We have retained Figure 12.3 as it shows these issues in the same two-dimensional space, but we have not managed to demonstrate the linkages visually - the words make those points about linkages directly.

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
747	77401	12	24	5	5	6	Update to this reference (now paginated publication): Adler, C.E., McEvoy, D., Chhetri, P., Kruk, E. (2013). The role of tourism in a changing climate for conservation and development. A problem-oriented study in the Kailash Sacred Landscape, Nepal. Policy Sciences, 46(2): 161-178. Online first in 2012, DOI 10.1007/s11077-012-9168-4 (Carolina Adler, Swiss Federal Institute of Technology (ETH) Zurich)	Updated
748	66839	12	24	7	24	7	Split infinitive: move 'peacefully' to after 'areas'. (Peter Burt, University of Greenwich)	Amended
749	73525	12	24	17	24	0	The authors should strongly consider inserting some supporting text to follow this first sentence: "When state and societal institutions perform in a manner seen as legitimate and effective - providing inclusive and accountable governance and delivering on basic services - the stresses generated by climate change are unlikely to ignite violent armed conflict. On the other hand, where deficits in legitimate and effective institutions are severe, climate change stress will contribute further to heightened risks of conflict." (UNITED STATES OF AMERICA)	Good suggestion - amended with this in mind
750	61323	12	24	17	24	18	It would seem rather reductive of this Chapter to state, in the synthesis, that "a key finding of this Chapter" is that "institutions are integral to the risks climate change poses". Surely one can think of other more important "key findings". (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	Noted, and the paragraph has been reworded to reflect this comment.
751	82583	12	24	18	24	42	The summary terms for evidence and agreement used on lines 18, 32, and 42 should be italicized. (Katharine Mach, IPCC WGII TSU)	Amended
752	82584	12	24	19	24	20	The point being made in this statement could be clarified. (Katharine Mach, IPCC WGII TSU)	Sentence has been removed in rewrite
753	66840	12	24	20	24	20	Text missing after 'biological'. (Peter Burt, University of Greenwich)	Sentence removed in rewrite
754	66841	12	24	22	24	22	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
755	82585	12	24	24	24	27	Given the preceding sentence, the role of institutions in this example could be clarified. Additionally, it would be preferable to provide cross-reference to the specific relevant sections of Chapter 7. (Katharine Mach, IPCC WGII TSU)	Meaning of the sentence amended and reference to institutions clarified
756	73526	12	24	26	24	26	The authors should consider deleting: "Thus, climate change is not yet the primary risk to human security." That is far too definitive a statement. After all, an absence of evidence is not evidence of absence. Perhaps begin paragraph with: "Climate change is currently understood to be one of many drivers of human security that vary in priority depending on location and circumstance." (UNITED STATES OF AMERICA)	Agreed. The wording has been amended to show that climate change has the potential to exacerbate insecurity rather than the implied ranking of threats and stresses
757	66842	12	24	27	24	27	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
758	62288	12	24	29	24	44	This paragraph focuses only on the discussion on adaptation and mitigation, it totally ignores the rapidly emerging debate on sustainability transition, as documented e.g. in the Routledge book Series on Sustainability Transition (since 2010) and in the new Elsevier Journal on Environmental Innovation and Sustainability Transition (EIST, since 2011). See also the report of the UN Secretary-General: UN-SG, 2009: Climate change and its possible security implications. Report of the Secretary-General. A/64/350 of 11 September 2009 (New York: United Nations) that refers among threat minimizers of climate change to several pathways towards sustainable development. (Hans Guenter Brauch, Free University of Berlin)	Good point. While the journal mentioned do not have specific papers related to this topic, there are good examples that demonstrate co-benefits of mitigation on health and well-being. This point is now made more clearly, for example with reference to the health co-benefits literature and to Chapter 11.
759	66843	12	24	33	24	33	Correct referencing style, plus 'et al.' in italics (Peter Burt, University of Greenwich)	Amended
760	66844	12	24	40	24	40	Delete comma after 'culture' (Peter Burt, University of Greenwich)	Amended
761	66845	12	24	43	24	43	Delete comma after 'mitigation' (Peter Burt, University of Greenwich)	Amended
762	66846	12	24	44	24	44	'et al.' should be in italics. (Peter Burt, University of Greenwich)	Amended
763	58704	12	24	46	0	0	Shouldn't it be "it is one of many drivers of human insecurity" (rather than "of human security")? (Joerg Friedrichs, University of Oxford)	Now deleted in rewrite
764	61324	12	24	46	24	46	The paragraph in the synthesis that begins with "thus" ("climate change is not yet the primary risk to human security") is misleading, because it does not seem to derive logically from the previous sentences to justify the use of the word "thus". (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	Have deleted 'thus'
765	82586	12	24	46	24	46	The logic of the transition "thus" is not completely clear, and perhaps the word could be deleted. (Katharine Mach, IPCC WGII TSU)	Have deleted 'thus'
766	84643	12	24	46	24	46	Does the "yet" here mean that it is expected to be in the future? It would be useful to clarify this point. (Michael Mastrandrea, IPCC WGII TSU)	Amended in rewrite

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
767	73527	12	24	46	24	51	It is difficult to improve on such a well written and thoughtful document. However the chapter is certainly is weighted toward a strong interpretation of climate change on security (as opposed to the opposite direction). To help with appearance of more balance, it might be useful to consider echoing text in the executive summary from page 24 line 46, starting with "Thus, climate change is not yet the primary risk to human security: it is one of the many drivers of human security..." (UNITED STATES OF AMERICA)	Good point. And we reflect on the conclusion in the light of the Executive Summary. However the plenary agreed outline asks for the chapter to assess climate change on human security, hence the dominance of that framing in the chapter.
768	73528	12	24	46	24	51	Who is saying climate change is the primary risk to human security? Why point this out and not just state the fact that climate change it is one of many drivers of insecurity? The text should be re-phrased accordingly and/or include citations. (UNITED STATES OF AMERICA)	Rewritten to clarify this statement
769	82587	12	25	1	25	3	Where high rates of warming are referenced on lines 1 and 3, are high magnitudes of warming relevant as well? (Katharine Mach, IPCC WGII TSU)	Should be levels - have amended
770	61325	12	25	4	25	7	What are the implications of this statement for future research: are there any mechanisms to reduce the reliance on previous past and present changes in light of this information? (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	Research recommendations now included in Box 12.2 at the front of the chapter
771	59002	12	25	10	0	0	These questions seem ad hoc. What are the principal threats to human security from climate change? What are the principal pathways and mechanisms by which climate change impacts human security? What are the consequence sof the most common adaptations, including migration, conflict, and cooperation? (Ken Conca, American University)	Good point. A principal threats question has now been added.
772	58705	12	25	10	25	37	I can see that people will frequently ask the question "Will climate change cause war between countries?" (FAQ 12.3), but I'm much less certain about the other two. Why do you think these are the questions people will ask most frequently? And if you're not sure, how could you find out which ones people are actually frequently asking? (Joerg Friedrichs, University of Oxford)	The drawing up of FAQs was done in consultation of the author team after reviewing the literature. The scope has now been extended by adding two further questions.
773	61326	12	25	12	25	20	It is not at all obvious why the question "How does lay knowledge of risks help adaptation to climate change?" would qualify a frequently asked one, to be included among the three selected FAQ's. (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	The role of lay knowledge is extremely important in human ecology, anthropology and other disciplines and also extremely important for regions where lay knowledge is heavily used by communities at risk. The FAQ will be placed in that section of the chapter and also reflects a major Executive Summary point
774	81257	12	25	22	0	0	FAQ 12-2 Displacement due to extreme events, or mobile communities that move between places during different seasons in a year may be considered in the answer. These movements may not be dominant like rural urban migration but they may be more related to climate variability. (Monalisa Chatterjee, IPCC WGII TSU)	The answer deals with the major migration flows, but the point is well made it does not cover all of them. Attempts to make the answer more nuanced included in redraft
775	81258	12	25	30	0	0	FAQ 12-3 Any example where institutions have been able to divert rivalries. (Monalisa Chatterjee, IPCC WGII TSU)	Transboundary water resource examples. The FAQ will be placed in that part of the chapter where this evidence is presented
776	73529	12	25	30	25	37	But the current evidence is unable to account for future projections of climate change on built infrastructure and communities, and whether or not there is institutional capacity to absorb these changes (Conca 2005; McDonald-Wilmsen et al., 2010; Sherbinin et al. 2011). This question as a whole - focused on civil war, is misleading regarding the research that is available about climate change as one of many factors that contributes to increased unrest. FAQ12.3 could be reworded to reflect the conclusions of this research. (UNITED STATES OF AMERICA)	The question is focussed on inter-state war which is a specific FAQ with reasonable convergence on the answer given. The FAQ will be placed at that point in the chapter where the evidence such as suggested is assessed.
777	73530	12	25	30	25	37	FAQ 12.3: This answer does not address the question and should be modified to reflect that while shared resources may be one source of conflict, changing access to natural resources is not the only impact of climate change that could cause war. Food insecurity and increased migrations may contribute to conflicts that lead to war as well. (UNITED STATES OF AMERICA)	No evidence in the literature of those leading specifically to inter-state war, which is the focus of the question
778	82588	12	25	34	25	34	Casual usage of "unlikely" should be avoided as it is a reserved likelihood term in the uncertainties guidance for authors. (Katharine Mach, IPCC WGII TSU)	Text amended to reflect suggestion

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
779	58706	12	25	35	25	37	To deflect concern that climate change may cause interstate conflict, you emphasize that "conflict resolution institutions have [been] able to divert rivalries in ways that avoid violent conflict". That's been true in recent decades. But why would climate change not challenge these institutions, too? Why for example would countries that are now wealthy and powerful undertake costly measures to stabilize situations far from home if we consider that these countries themselves are likely be struggling to cope with the adverse effects of climate change? You are right that conflict resolution institutions have been effective and may continue to be so for a while, but at some point people and decision makers may decide to pursue narrow notions of self-help rather than to promote institutions. (Joerg Friedrichs, University of Oxford)	Agreed that the presence and effectiveness of institutions may be affected by climate change itself. But there is little evidence or analysis of this topic so not included in the FAQ as it stands
780	56347	12	25	36	25	36	sentence structure incorrect (Thomas Reuter, University of Melbourne)	Amended
781	69169	12	26	35	26	37	Reference pages should be added as pp. 1-24 (NETHERLANDS)	Amended
782	59003	12	31	3	0	0	This publication is 2006, not 2002 (Ken Conca, American University)	Amended
783	66847	12	39	39	40	11	References out of alphabetical order (in Scottish surnames 'Mac' and 'Mc' are treated the same, therefore this block should start on line11). (Peter Burt, University of Greenwich)	Amended
784	63449	12	41	19	41	19	This reference is incorrect. It should read: "Nicholls, R. J., Marinova, N., Lowe, J. A., Brown, S., Vellinga, P., de Gusmão, D., Hinkel, J. and Tol, R. S. J., 2011: Sea-level rise and its possible impacts given a 'beyond 4°C world' in the twenty-first century. Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences, 369 (1934), 161-181." (Diogo de Gusmao, Met Office Hadley Centre)	Amended
785	69170	12	43	25	43	26	Reference pages should be corrected as "1925-1945" instead of "1925 at 1925" (NETHERLANDS)	Amended
786	60406	12	45	30	45	32	There has been some confusion over this reference. It should read: Smith, C., 2013: Modelling migration futures in Tanzania: Development and testing of the Rainfalls Agent-Based Migration Model-Tanzania. Climate and Development. Submitted. Available from the author at UNU-EHS. (Christopher Smith, United Nations University)	Amended
787	80408	12	46	0	0	0	Table 12-1: This table tends to stray into WGI-type physical climate changes (e.g., Glaciers and Ice caps, Floods in NL). It will be essential to ensure consistency with relevant material in chapter 3 of the SREX, and from the observation and projection chapters of the WGI AR5 (i.e., Chapters 2, 4, 11 – 14). (Gian-Kasper Plattner, IPCC WGI TSU)	Useful to have pointed out this cross-referencing to ensure consistency
788	63286	12	47	31	47	31	"Prager" should read "Praeger" (Christian Webersik, University of Agder)	Amended
789	66848	12	47	32	47	32	Move full stop up one line. (Peter Burt, University of Greenwich)	Amended
790	73531	12	49	0	0	0	Table 12-1: Under "Water Stress and Scarcity" flooding should be explicitly stated as one of the downstream impacts. Under "Destruction of homes and properties," an increased risk of forest fires should be mentioned. (UNITED STATES OF AMERICA)	Table includes illustrative examples and is not a comprehensive list. Table title has been correspondingly amended.
791	82589	12	49	0	0	0	Table 12-1. I will provide a number of small suggestions for this table, attempting to identify the relevant entries as clearly as possible. For the 2nd bullet of the box at the intersection of livelihood assets and evidence from observations, is "disposed" the clearest descriptor? Selling off assets, versus slaughtering livestock, versus tossing assets in the trash, could be differing meanings of "disposed," and the intended meaning could perhaps be clarified further. For the 1st and 2nd bullets of the box at the intersection of livelihood assets and projections, specific cross-reference to relevant sections of Chapter 7 could be provided. For the 1st bullet at the intersection of water stress and scarcity and evidence from observation, specific cross-reference to relevant sections of chapter 3 could be provided; for the 2nd bullet within this box, would placement under "projections" be more appropriate? For the 2nd bullet in the box at the intersection of water stress and projections, specific cross-reference to chapter 3 could be provided. For the 3rd bullet in the box at the intersection of destruction of homes and property and evidence from observations, would placement under projections, one box to the right, be more appropriate? For the 2nd bullet within the box at the intersection of destruction of homes and property and projections, specific cross-reference to chapter 10 could be provided. (Katharine Mach, IPCC WGII TSU)	Amended.

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
792	58088	12	49	0	49	0	Table 12-1. Under the dimension of impacts could be included Ecosystem services mining or eroding. In rural areas and medium and small cities of the world that are still very dependent on ecosystem services, the impact of climate change on such services needs to be considered. Change on species and ecosystems could have an impact on the ecosystem services provision, for example if Paramos in the Andean Region are not resilient to climate change many cities including capital cities in the region will face water scarcity. In coastal areas if coral reefs, seagrasses, mangroves and saltmarshes are not able to cope with climate change, their natural protective role will also diminish. Pollinators role could also be affected by climate change and hence food security. Pests and plagues could expand the distribution areas as has been suggested with dengue and malaria... etc . There are plenty references in the report see for example chapter 27 page 17 where is discussed the potential impacts of CC on South and Central America biodiversity (Carmen Lacambra Segura, Grupo La era)	Table includes illustrative examples and not a comprehensive list. Table title has been correspondingly amended.
793	62291	12	49	0	50	0	The selected literature in this table does not offer criteria why the categories of livelihood assets, water stress and scarcity, destruction of homes and properties, agriculture and food security and human capital were chosen, and why the impact of both floods was ignored. Relying solely on abstracts of literature cited in Scopus may not be representative at all, as the regions with the highest impacts of floods (especially India and China) are not noted. This is a fundamental shortcoming of the literature to be included in this assessment. There are many peer-reviewed studies in those regions and from schools from those regions that were just not included. The Northern focus of the authors may thus have been reinforced by the literature that was selected for assessment.. (Hans Guenter Brauch, Free University of Berlin)	Table includes illustrative examples and not a comprehensive list. Table title has been correspondingly amended.
794	61328	12	49	1	0	0	Table 12.1. I wondered if the evidence on floods in Fiji and asset loss should be moved to the livelihood assets?+ (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	We think it is more appropriate to keep it in the livelihood assets box, given that the article talks about losses to households.
795	61327	12	49	1	49	0	Table 12.1. Livelihood assets - should there be a point made here on the projections for flooding to match the other points made under evidence from observations? (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	Table includes illustrative examples and is not a comprehensive list. Table title has been correspondingly amended.
796	82590	12	50	0	0	0	Table 12-1. For the 1st bullet of the box at the intersection of agriculture and projections, casual usage of the likelihood term "likely" should be avoided. Additionally, specific cross-reference to relevant sections of Chapter 7 or 22 could be considered. For the 1st bullet within the health observations box and for the 3rd bullet within the health projections box, specific cross-reference to chapter 11 could be provided. For the 2nd bullet within the health projections box, casual usage of "likely" should be avoided. (Katharine Mach, IPCC WGII TSU)	Amended
797	66260	12	51	0	0	0	Table 12-2. Confusing table. The "statements" in column two and three should be shortened and reduced in numbers. Lowest row: Several more papers could support the statement: "climate knowledge with local relevance will facilitate adaptation": Dannevig, H., Rauken, T., & Hovelsrud, G. (2012). Implementing adaptation to climate change at the local level. Local Environment, 17(6-7), 597–611. doi:10.1080/13549839.2012.678317 (Halvor Dannevig, Western Norway Research Institute)	The table has been edited for clarity and length. The reference has been added.
798	62292	12	51	0	51	0	This figure on the cultural dimension of human security in the context of climate change is truly comprehensive, however, it is unclear why other dimensions of human security were not give a similar emphasis. (Hans Guenter Brauch, Free University of Berlin)	The different elements of the human security picture (livelihoods, migration, conflict) do not fit easily into this table assessment. Each section is also comprehensive, but without using this Table format.
799	80087	12	51	0	51	0	Table 12-2. Excellent table, text clear and to the point (Mikko Halonen, Gaia Consulting Oy)	Noted

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
800	60404	12	52	0	0	0	Table 12-3. Final bullet point of 3rd section (last 3 lines of page 52). It should be noted that the 'extreme drying' was a hypothetical scenario used to test the range of influence of rainfall. Text along the lines of 'was greatest under a hypothetical scenario of extreme drying' might be more appropriate. The reference is also incorrect. These findings are from a UNU-EHS policy report - <a href="http://www.ehs.unu.edu/file/get/10569.pdf">http://www.ehs.unu.edu/file/get/10569.pdf</a> . Citation: Warner, K., T. Afifi, K. Henry, T. Rawe, C. Smith, A. de Sherbinin, 2012: Where the rain falls: Climate change, food and livelihood security, and migration. United Nations University. Bonn. The Tanzania model findings presented here could also be placed in better context by citing the later Smith (2013) paper that shows that, although need-driven migration was seen to be proportionally more sensitive to changes in rainfall than aspirational migration, the smaller actual numbers of need-driven migrants mean that they have little real impact upon total migrant numbers. Citation: Smith, C., 2013: Modelling migration futures in Tanzania: Development and testing of the Rainfalls Agent-Based Migration Model-Tanzania. Climate and Development. Submitted. Available from the author at UNU-EHS. (Christopher Smith, United Nations University)	Amendment made to make the point clearer
801	82591	12	52	0	0	0	Table 12-3. Communication of the relevant specific details for examples provided in this box should be ensured. For example, the reader should be able to understand the relevant time frame and/or type of relevant weather event for each example (for both observations and projections). Within the 1st box, for example, time frames could be specified for the examples for Ethiopia, Mexico, and Guatemala; 2 boxes down, time frames could be specified for the 1st Burkina Faso example and for the Ecuador example. On the 2nd page of the table, the relevant time frame for the 1st Bangladesh example could be clarified, along with the timeframe for the example for Vanuatu. For the 1st United States example under sea level rise, the relevant geographic area within the US should be clarified, along with the time frame. (Katharine Mach, IPCC WGII TSU)	Amendments made where the details are able to be interpreted from the original sources
802	84644	12	52	0	0	0	Table 12-3: While I think it can work to include both observed and projected outcomes in the table, it is important to specify in each case whether the described outcome has been observed, is projected for the future, or reflects both observations and projections. This is not always clear, currently. (Michael Mastrandrea, IPCC WGII TSU)	Good point. The examples in each box have been grouped by whether they are observed or projected
803	62293	12	52	0	52	0	Againn the selection of cases may have relied on the available journal abstracts in Scopus and not on the relevant importance of the impact of drought and land degradation. According to a search in EMDAT database as of 22 May 2013 the ten most serious droughts < <a href="http://www.emdat.be/result-disaster-profiles?disgroup=natural&amp;period=1900%242013&amp;dis_type=Drought&amp;Submit=Display+Disaster+Profile">http://www.emdat.be/result-disaster-profiles?disgroup=natural&amp;period=1900%242013&amp;dis_type=Drought&amp;Submit=Display+Disaster+Profile</a> > the ten most deadly dorughts, with the highest number of people affected and the highest economic damage) may have let to a different inclusion of literature to be assessed. The ten most important droughts from 1900 to 2013 occurred in India (6) and China (4). Hoever, there is no reference to China and only one by Jülich to temperary migration in one East Indian village. Is this reference representative for the 1 billion and 50 million people in India that were affected by six droughts? (Hans Guenter Brauch, Free University of Berlin)	The Table is not about the seriousness of droughts, floods or other types of events. It is documented and rigorous studies of whether those types of events lead to more or less migration and in what circumstances. Hence the scale of the event is secondary information and not easily derived from the original studies. In addition some studies are related to longer-term environmental change, such as island abandonment in the 19th century Maryland case.
804	81415	12	52	0	53	0	Table 12-3: Perhaps the location and sources can be presented in separate columns to increase readability. (Yuka Estrada, IPCC WGII TSU)	Have implemented this excellent suggestion
805	61329	12	52	1	0	0	Table 12.3. Uganda - "high soil quality marginally increases migration" This is in the evidence for decreased migration. Is this right? (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	Checked the two results from the Grey paper - Uganda and Kenya where the effect is opposite. Clarified - degradation concluded to reduce migration in the Uganda case
806	59013	12	52	1	52	0	Table 12-3 is really useful. However, some of the case studies in the 'drought and land degradation' section don't quite seem to fit their headings, particularly the Nepal and Uganda examples in the 'evidence for decreased migration. . . ' section. (Celia McMichael, La Trobe University)	Clarified these to make more explicit the implications of climate change impacts
807	62294	12	53	0	53	0	The same argument about the potential lack of representative cases chosen also applies to floods. According to a search in EMDAT database as of 22 May 2013of the ten most serious floods from 19000 to 2013 refer to 9 floods in China and one in India. However, both countries are not listed with any study that was assessed. It is doubtful that from the list presented policy-relevant conclusions may be drawn. (Hans Guenter Brauch, Free University of Berlin)	The Table is not about the seriousness of droughts, floods or other types of events. It is documented and rigorous studies of whether those types of events lead to more or less migration and in what circumstances. Hence the scale of the event is secondary information and not easily derived from the original studies. In addition some studies are related to longer-term environmental change, such as island abandonment in the 19th century Maryland case.



#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
808	61330	12	53	1	0	0	Senegal, over 40% new migrants located in the high risk flood plain. Is it evidence of a trapped population? And same for Tuvalu. Perhaps the down arrow is a little misleading as it is not a decrease in migration but evidence of a trapped population. (European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)	Good point. The down arrow in this instance indicates no presence of increased mobility or migration propensity - clarified in the heading
809	58707	12	54	0	0	0	Figure 12-1 is hard to interpret. After some eyeballing I've understood it, but I feel it detracts from rather than adds to the clarity of the text. If you stick to it, the legend should perhaps read "Ability to move and vulnerability are inversely associated", as this would use the same terms as in the table and avoid the loaded term "correlation". (Joerg Friedrichs, University of Oxford)	Suggestion for amending the caption works and has been implemented
810	58708	12	54	0	0	0	When I look at the data in Figure 12-2, the only thing it really seems to suggest is that conflict and post-conflict countries never have high governance effectiveness. Below the horizontal axis there is no clear pattern, and conflict and post-conflict countries seem to be only marginally lower on the HDI than other developing countries. (Joerg Friedrichs, University of Oxford)	Most countries in the sample have low governance effectiveness in the dataset - the subsample is all developing countries. The interpretation is correct that post-conflict countries have lower HDI.
811	63288	12	54	0	0	0	Figure 12-2 maybe correct but the overlapping symbols prevent an appropriate visual expression of the claim that conflict and post-conflict societies exhibit low levels of governance and human development. (Christian Webersik, University of Agder)	Hopefully the final version will be clear in colour that the subsamples are distinct. Over to the graphics people.
812	65523	12	54	0	0	0	Figure 12.1. 1 vulnerability and environmental change - where is the independent and dependent variable) X-axis: well-being an capital, how come there is a positive relationship between x and y (vulnerability to environmental change)? Text mentions that there is an inverse relationship between mobility and vulnerability. How is this show in the graph? Unit of measure should either be conflict, post-conflict and non-conflict countries or developed and developing countries. But the authors use developing countries and compare them with conflict and post-conflict countries (contrast is not clear). Important to explain what the figures indicates (not clear). Scatter plot needs to be explained more adequately (governance effectiveness and HDI on x and y axes), what is exactly the relationship between both of them, which one influences the other? (Tamer Afifi, United Nations University Institute for Environment and Human Security)	The comments here seem to be related to both Figure 12.1 and 12.2, so not clear exactly the point being made. The inverse relationship between vulnerability and mobility is shown clearly in Figure 12.1. The points about lack of clarity in the 12.2 graphic are well made and will hopefully be sorted by clearer graphic design.
813	73532	12	54	0	0	0	Figure 12-1: This figure is not especially clear- it confuses a concept that can be explained very easily with words. Recommend cutting this figure out. (UNITED STATES OF AMERICA)	This recommendation for cutting Figure 12.1 was considered by the author team when the whole Chapter was complete. As the comment states, the text has been amended to be very clear about their posited inverse relationship - some data in Table 12.3 supports this claim. More detail in the text added.
814	81416	12	54	0	0	0	Figure 12-1: The figure caption seems to be confusing and incomplete (i.e., no mention of what "trapped population" is. The text (P 12 Line 48-52) explains the figure better. (Yuka Estrada, IPCC WGII TSU)	Good point - caption amended to reflect the text from page 12.
815	81417	12	54	0	0	0	Figure 12-2: The figure caption needs much more explanation. Please explain how Governance effectiveness and Human development index are calculated. (Yuka Estrada, IPCC WGII TSU)	Previous versions of the caption had this detail but were omitted for clarity. They have now been reintroduced.
816	82592	12	54	0	0	0	Figure 12-2. Beyond the scatter plots provided, the chapter team should consider plotting relevant summary statistics, for example box and whisker plots of relevant averages and measures of variability for each category and axis. (Katharine Mach, IPCC WGII TSU)	In the end we stick with the scatter plot as it is quite intuitive. No box and whiskers diagram included. Some amendments to sources and to text to increase clarity
817	84645	12	54	0	0	0	Figure 12-2: This is a useful figure, and it would be valuable to consider ways to depict the overall difference between blue and red sets. If appropriate, displaying aggregate measures of mean and spread would be very useful. (Michael Mastrandrea, IPCC WGII TSU)	Good points. We present the data in the same manner (no box and whisker plot), but have increased clarity in the text
818	58710	12	54	0	55	0	There are three Figures in the chapter, and none of them seems particularly strong to me. That's a problem because you'll see after publication that people get very much fixated with Figures. This is what they will remember, and this is what they will debate online. You really should make sure that your figures are extremely clear and meaningful. (Joerg Friedrichs, University of Oxford)	Thanks for the words of caution. The author team has debated the usefulness of the Figures, especially in the light of adding new Table 4 with the risk assessment included.
819	58709	12	55	0	0	0	Figure 12-3 is almost impossible to follow. The arrows seem to suggest movement of problems on the spatial and climate stress axes, but it's hardly intelligible in these terms. I've chewed it over for some time but still don't get it. [On a truly minor note: in the figure, where you refer to subsection 2.2, you apparently mean 12.2, etc.] (Joerg Friedrichs, University of Oxford)	We have attempted to clarify in the text, and in a revised caption, the interpretation of the table

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
820	60405	12	55	0	0	0	Figure 12-3. The text associated with Figure 12-3 (page 24, line 3 to page 24, line 10) provides a useful example of the complexity associated with interactions between the elements of human security discussed in the chapter. However, I do not find Figure 12-3 a useful representation of this complexity. I do not see how the variables listed on the x and y axis relate to either the ellipses or the security changes indicated by arrows. In my opinion the text alone portrays the interactions more effectively. (Christopher Smith, United Nations University)	We have attempted to clarify by cross-referring the text and making the caption clearer.
821	62295	12	55	0	0	0	Figure 12.3: The reference to transboundary institutions mediate resource rivalry (12.6) may be a bit misleading as this section only refers to the national security dimension of climate change and ignores the international security dimension of climate change. (Hans Guenter Brauch, Free University of Berlin)	The distinction between national security and international security is a nuanced and fine point here. The example in the figure, elaborated in the text is clear - that international institutions mediate rivalry between countries - whether this is interpreted as assisting the security of multiple parties or of the international dimension is a fine-grained point.
822	63287	12	55	0	0	0	Figure 12-3 is very complex and too clear to the reader. For example, the issue that "land grabs exacerbate land tenure conflicts" maybe true but the visual representation does not show an increase in conflict frequency or intensity (since the two circles stay within the conflict bubble). Overall, suggest to deleting this figure and replacing with more meaningful synthesis figure. (Christian Webersik, University of Agder)	We have attempted to increase clarity through redrawing some of the interventions and labelling more clearly. The text has also been amended to explain the diagram more clearly. The Figure is augmented in this section has the new Risk Table 12.4
823	65524	12	55	0	0	0	Figure 12.3: The overlap between the four factors cultural change, conflict, migration and livelihoods must be better explained. What is the mechanism? Not enough to put examples. Why are only these factors included (what are the criteria in selecting them)? (Tamer Afifi, United Nations University Institute for Environment and Human Security)	Again the text is quite clear but the figure difficult to quickly interpret. Space precludes a long discussion on how the criteria are selected.
824	73533	12	55	0	0	0	Figure 12.3, locating migration and mobility only in the lower range of climate stress is not reflective of the whole issue and should be modified. Clearly, higher levels of stress are associated with greater requirements for transformational change, often involving relocation (see Chapter 20). (UNITED STATES OF AMERICA)	The migration is in the lower part of the space to indicate that the majority of mobility and migration issues are national issues rather than geo-political.
825	81418	12	55	0	0	0	Figure 12-3: The figure caption needs to explain all elements of the figure so that it can stand alone. The legend (blue vs red arrows, solid vs open circles) should be provided in the caption. (Yuka Estrada, IPCC WGII TSU)	Good point - caption amended and much more explanatory.
826	82593	12	55	0	0	0	Figure 12-3. Given the importance of this figure in summarizing the assessment of the chapter, I would strongly encourage the chapter team to ensure it communicates as much as possible, as clearly as possible. For example, although the figure caption asserts that the figure demonstrates interactions between elements, it is not really clear where feedbacks and interactions can be observed in the graphic. To indicate interactions, elements of a "flow" diagram could be considered, with arrows indicating the direction and nature of interactions. For the title of the Y axis, it is not really clear what is meant by "climate stress"--are physical stressors/hazards associated with climate change being referred to? Or, more nearly, is the axis being used as a metric for vulnerability and exposure in examples given? Finally, I'm not sure I understand why the arrow for "income loss reduces mobility for low income pastoralists" is blue, given that blue arrows seem to be reserved for positive changes in the other examples. (Katharine Mach, IPCC WGII TSU)	Much effort has been put in to making this Figure more efficient in conveying the key messages that are in the text.
827	84646	12	55	0	0	0	Figure 12-3: As mentioned in the context of the chapter text where this figure is introduced, the figure does not really depict interactions such as those described in the text. It would be very useful to devise a way to illustrate these cascading interactions. It is also unclear what the vertical axis represents. Does it encompass climate variability and climate change, for example? Finally, the line of sight in some of the boxes says "2" rather than "12". (Michael Mastrandrea, IPCC WGII TSU)	Figure amended to incorporate mistaken labelling. The text has difficulty depicting interactions, but does show that the ellipses intersect and therefore conveys interaction space, if not change. The amended caption explains the Figure better. And the text continues to explain interaction, especially the temporal dynamics that cannot be easily captured in two dimensional space in this Figure.