

#	Ch	From Page	From Line	To Page	To Line	Comment
1	14	0	0	0	0	General Comments on Chapter 14. Adaptation Needs and Options: This chapter deals with adaptation needs, options, actors & roles in adaptation and adaptation assessment. The impressive part in this chapter is the measuring adaptation. Tables 14-1 for the categories & examples of adaptation needs and Table 4-2 for the categories & examples of adaptation options are very clear & useful to identify the ideas in very clear format. Also, Figure 14-2 for the generic framework for vulnerability & adaptation assessments which clarified the processes till the decision & monitoring the activities. (Labib, Mounir Wahba , Third National Communication (TNC) Project)
2	14	0	0	0	0	Chapter 14 Overall Comment: this chapter remains difficult to read. It would benefit from significant reorganization to flow more like the other AR5 WGII chapters. (Wilson, Lynn, SeaTrust Institute)
3	14	0	0	0	0	A revision of the English is needed throughout the chapter. It is not very clear and there are many incomplete or senseless sentences. The draft needs an in-depth editorial review. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
4	14	0	0	0	0	Overall, the impression is that there is plenty of quoting across the chapter but the findings expressed are incomplete or not well structured. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
5	14	0	0	0	0	Having introduced the distinction between incremental and transformative adaptation in the opening chapter, this would appear an appropriate chapter to re-visit and further discuss the implications. The opportunity is missed here. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
6	14	0	0	0	0	I suggest that somewhere some discussion is included on the potential role for project level environmental impact assessment and programme/plan level strategic environmental impact assessment. There is a growing literature and professional interest in how climate concerns can be mainstreamed within these, and the EU is due to issue guidance. It might fit in section 14.7.3 on screening for maladaptation, or in a section on the importance of spatial planning (a theme which is not given much prominence here - perhaps it is in other chapters). (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
7	14	0	0	0	0	the chapter hardly one or two examples from the South Asian region. Considering the fact that countries like Bangladesh and India are quite advanced and innovative in implementing adaptation options it would be helpful to have brought specific references from the region. (INDIA)
8	14	0	0	0	0	General suggestion which would very much assist mathematical and modelling researchers in their work: It would be helpful to have more specific comments, such as by how much can we reduce damages through which adaptation measures. It would be nice to have an overview on sectors, adaptation measures, adaptation impact under IPCC scenarios (A1B, A2, B1) e.g. agriculture: crop choice, irrigation, ..., 10-15% under A1B scenario, 50-60% under A2 scenario. There are different studies and one could give an overview of what has been found in the literature. (Trapp, Natalie, University of Hamburg and International Max Planck Research School on Earth System Modelling)
9	14	0	0	0	0	Social and political prospective in entities that are highly vulnerable to climate change impacts especially in the water and land-use sectors. The case of the Palestinians being unable to freely manage their natural resources that are controlled totally by the Israelis make them highly vulnerable to CC impacts. Please refer to United Nations, World Bank and Human Rights report on that matter. (Khatib, Imad, Palestine Academy for Science and Technology)
10	14	0	0	0	0	Growth in urbanization and the effect of mega cities in developing countries need to be addressed. (Khatib, Imad, Palestine Academy for Science and Technology)

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11	14	0	0	0	0	Comments provided on Chapter 14 and submitted by David Rissik were developed at a one day Sydney workshop of the following reviewers: Melissa Nursey-Bray (University of Adelaide), Darryn McEvoy (RMIT), Karen Hussey (ANU), Sarah Boulter (Griffith University), Jean Palutikof (Griffith University), Ron Cox (UNSW), Matthew Mason (Macquarie University), James Duggie (Government of Western Australia), Peter Hayman (Government of South Australia), David King (James Cook University), Alistair Hobday (CSIRO) (Rissik, David, Griffith University)
12	14	0	0	0	0	There was some concern that Chapters 14, 15 and 16 had considerable overlap. It was felt that it would be useful in this first and introductory chapter on adaptation that a schematic of how the chapters fit together would be useful (Rissik, David, Griffith University)
13	14	0	0	0	0	The chapter is very specific about delivery of adaptation in the purest sense – it does not contain enough on how adaptation has occurred through disaster management - and yet, pragmatically, that is generally how adaptation occurs. Nor does it lead us to make this distinction between disaster management (short-term) and adaptation (longer-term) which is a useful framing, especially given the SREX report. (Rissik, David, Griffith University)
14	14	0	0	0	0	IPCC is the go-to place for 'reliable' definitions. There is some responsibility to the wider community. Not using widely accepted definitions is a barrier. Need to define some of the terminology: adaptation, resilience, risk, adaptation needs, coping behaviour. Ever expanding number of terms: 'bottleneck', 'paradox', 'manipulation' – not helpful. This area doesn't need new terms and most of them don't need to be inside parentheses - it looks like an attempt to impose an apparent profundity. (Rissik, David, Griffith University)
15	14	0	0	0	0	Adapting to what? 2deg? 4 deg? Affects what you do – whether you go down a pathway of incremental or transformational adaptation. (Rissik, David, Griffith University)
16	14	0	0	0	0	Transformational change. Should be more explicit in how define. It is a "jargon" term that has escaped into the adaptation literature. Needs tagging and explaining – can't remove it. (Rissik, David, Griffith University)
17	14	0	0	0	0	A reliance throughout chapter on old references, misses much of the new work that has been done. (Rissik, David, Griffith University)
18	14	0	0	0	0	Governance material overlaps with Ch15 and 16. Chapter 14 is unique on maladaptation. Need much more framing here and then can cut out much of overlap with 15 and 16. Look at Fuenfgeld and McEvoy paper for framing reference: Fünfgeld H. & D. McEvoy (2011) Framing Climate Change Adaptation in Policy and Practice, VCCCAR working paper 1, VCCCAR, Australia. ISBN 978 0 7340 http://www.vcccar.org.au/files/vcccar/Framing_project_workingpaper1_240511.pdf (Rissik, David, Griffith University)
19	14	0	0	0	0	Chapter references too many examples from the developing world. Means that emphasis on vulnerability is inevitable. (Rissik, David, Griffith University)
20	14	0	0	0	0	In the Chapter executive summary it is clear that local governance and institutions deliver adaptation most effectively. In the chapter body, the message is slightly different - more nuanced. Need to carry this nuancing into the executive summary to avoid giving the wrong impression. (Rissik, David, Griffith University)
21	14	0	0	0	0	Chapter is never clear about resilience, and whether it concludes from the assessment that this is a useful concept or not. It is still found to be a useful concept here in Australia, and a view on this from an authoritative source such as this chapter would be valuable for the adaptation community. (Rissik, David, Griffith University)
22	14	0	0	0	0	Nothing about thresholds and limits in this chapter, which seems like a huge gap given the literature - we will upload the reports from NCCARF on limits to adaptation in Australia. (Rissik, David, Griffith University)
23	14	0	0	0	0	Flavour of the chapter is very negative. Nothing positive – adaptation needs discussion is all about risks and vulnerability. Opportunities are not discussed and should be. (Rissik, David, Griffith University)
24	14	0	0	0	0	Chapter overwhelmingly human – it is very weak on ecosystems. Maybe this is especially the case in the section on Maladaptation (Rissik, David, Griffith University)

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25	14	0	0	0	0	Despite the fact that the majority of humans live in cities, the chapter omits the major cities of the world and their problems, e.g., around infrastructure, especially in the developed world. See for example: Mehrotra, S., J. Carmin, A. Fenech, H. Fünfgeld, Y. Labane, J. Li, R. Roggema, F. Thomalla, and C. Rosenzweig, 2013: Adapting to climate change in cities. In Climate Adaptation Futures. J. Palutikof, S.L. Boulter, A.J. Ash, M.S. Smith, M. Parry, M. Waschka, and D. Guitart, Eds. Wiley-Blackwell, 311-321. Mehrotra, S., C.E. Natenzon, A. Omojola, J. Gilbride, and C. Rosenzweig, 2012: Framework for city climate risk assessment. In Cities and Climate Change: Responding to an Urgent Agenda, Vol. 2, Urban Development Series. World Bank, 182-241. (Rissik, David, Griffith University)
26	14	0	0	0	0	The division of issues of adaptation planning into two chapters: Chapters 14 and 15, is somewhat confusing to the reader, especially as the chapters have been written by different author teams and consequently the approaches taken in the chapters differ. An idea would be to merge these chapters (and possibly also chapter 16) to get a more comprehensive view and approach on adaptation planning, decision making and implementation. If adaptation planning and implementation, however, are treated in separate chapters, it would be very useful if in the beginning of this chapter (as it establishes the foundation for the following three adaptation chapters) it would be clearly described in which chapters the different parts of the adaptation process and governance are discussed and treated and why the division to separate chapters is necessary. Also, a common framework for the adaptation chapters would need to be presented, an "adaptation theory". (Kankaanpää, Susanna, Helsinki Region Environmental Services Authority (HSY))
27	14	0	0	0	0	Why not tackle (introducing) adaptation options from a legal perspective? Or social equity/human rights? It could be added to structural options pg. 8, institutional, pg 10, informational strategies pg.11 (Corendea, Cosmin, United Nations University Institute for Environment and Human Security)
28	14	0	0	0	0	14.2.4: resource needs does not mention emerging climate finance like the Green Climate Fund and other parts of the climate finance landscape. Missing reference (?) to 100 bn committed in Copenhagen, or fast start finance. Section references could be bolstered (economics of adaptation study by McKenzie and Swiss Re? (Corendea, Cosmin, United Nations University Institute for Environment and Human Security)
29	14	0	0	0	0	The Figure 14.2 is too general for a framework for vulnerability and adaptation assessment. More information should be included to make this clearer. For example, in the case of the vulnerability assessment, this figure does not show how to obtain/analyze vulnerability (some elements should be considered: Exposure, Sensitivity, and Adaptive Capacity). This figure shows generic steps to make any plan, but what is additionally required for an adaptation plan?. Moreover, a step called "assess risk" is included while there are no steps on "vulnerability assessment", which generates confusion (we need to understand vulnerability to know risk, but not the opposite). (COLOMBIA)
30	14	0	0	0	0	In general, this chapter would benefit from more specific examples. In some areas of text, it contains over a page of generalizations and conceptual language with no examples to illustrate the points that are being made. This style makes it read a bit more like a textbook chapter (that is explaining basic concepts) as opposed to an assessment chapter. (UNITED STATES OF AMERICA)
31	14	0	0	0	0	Plain language would be very helpful to make this document more accessible to the average reader that would be interested to understand and use this in the applied science arenas. (UNITED STATES OF AMERICA)
32	14	0	0	0	0	The chapter is quite uneven. It is difficult to follow the chapter from beginning to end. Some content is well structured and easy to understand and other sections seem to string together citations and information without clear flow or conclusion. When sections do not include a clear narrative, the strings of citations imply conclusions that do not seem justified - as opposed to synthesizing complex information into sound reliable findings. (UNITED STATES OF AMERICA)

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33	14	0	0	0	0	The chapter reads smoothly and is logically organized. Education and attention to shared learning as needs does not surface often enough. The overall goals of adaptation absolutely needs more investment in education at all levels as well as shared lessons across communities, cities, countries, sectors, businesses, etc. Overall, very sparse attention to needs from an ecological perspective. These are certainly great, indeed, including the extent to which preservation and restoration of ecosystem health has substantial knowledge and monitoring needs. Although the social context is recognized in a general sense, overall the chapter could use more attention to political viability. At times the tone with respect to political issues does not include the reality that there are simply issues that are more immediately pressing on human quality of life and that is simply the context within which adaptation planning sits; important because to the extent that adaptation planning mitigates factors that press on human welfare in the near term, its needs become more salient. (UNITED STATES OF AMERICA)
34	14	0	0	0	0	The distinction/mission space/skill sets between prevention and preparedness/response/recovery needs to be stronger in this chapter as the time and spatial scales are vastly different. (UNITED STATES OF AMERICA)
35	14	0	0	0	0	The mention of private sector in the exec. summary does not get space through out the document. Please add more about private sector role throughout. (UNITED STATES OF AMERICA)
36	14	0	0	0	0	The order of this chapter would flow better and be more accessible if it followed a narrative process. It is confusing why 14.5 assessments are after the other sections. Plan Do Check Act... a diagram showing this flow like Fig 14-2 would be helpful if in the front of the chapter. (UNITED STATES OF AMERICA)
37	14	0	0	0	0	This chapter deals mostly with adaptation in urban settings and fails to communicate how systems are connected and interdependent on each other. Natural ecosystems are given very little lip service and with few exceptions, are not linked to adaptation needs of society. Reading this chapter would lead one to believe that the use of ecosystems is only for buffering urban systems from climate impacts via green infrastructure; even then there is no mention that the green infrastructure must be designed to be adapted to both current and future climates. Early in the chapter needs to lay out the broad scope of how climate change will impact society from a variety of direct and indirect sources. Secondly, natural ecosystems provide key services to urban environments. One that comes to mind is clean water. In the US, much of the water for human consumption originates on forested lands, and the quality of the water is heavily dependent on the conditions of the ecosystems through which it flows. (UNITED STATES OF AMERICA)
38	14	0	0	0	0	This chapter does not mention the vulnerabilities of a global supply chain of goods. (UNITED STATES OF AMERICA)
39	14	0	0	0	0	This chapter has a strong emphasis on institutional and social capacity - but is relatively weak on ecological/ecosystem content. More balance would strengthen the chapter. (UNITED STATES OF AMERICA)
40	14	0	0	0	0	Through out the chapter there is a mixing of extreme weather incidents and incremental climate change. It may be helpful to clarify that the methods of the "first responders" (preparation, response, recovery) is not likely to change whereas those working in the "prevention" mission space have a iterative, incremental and integrated process to be managed over time. What are or can stakeholders do today so that they are less vulnerable over time? (UNITED STATES OF AMERICA)

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41	14	0	0	0	0	Throughout, the chapter focuses on modern issues. There is a growing body of research on what might be called long-term human ecodynamics, primarily by archaeologists, environmental historians and paleoecologists, which is directed not only at understanding the past, but providing information which can be used to make choices that support a sustainable future and increase resilience in the face of environmental changes, fast or slow (Constanza, Graumlich, and Steffen 2007; Cooper and Sheets 2012; Crumley 1994; Dugmore et al. 2007; Fisher, Hill, and Feinman 2009; Hornberg, McNeill, and Martinez-Alier 2007; Kirch 1997, 2007; Kohler and van der Leeuw 2007; Marks 2007; McGovern et al 2007; Norberg et al. 2008; Redman et al. 2004; Rick and Erlandson 2008; Sabloff 1998). In essence, past societies can be considered as completed long term experiments in human adaptation to environmental change. This approach reduces many of the issues identified with attempts to forecast adaptation & sustainability, and with short time frames for evaluation. It would seem that this literature should be considered in the sections on adaptation, even if just to recommend that this approach be utilized in planning where at all possible. Recommended citations: Constanza, Robert, Lisa J. Graumlich, and Will Steffen, eds. 2007 Sustainability or Collapse? An Integrated History and Future of People on Earth. MIT Press, Cambridge, MA. Cooper, Jago, and Payson Sheets, eds. 2012 Surviving Sudden Environmental Change: Answers from Archaeology. University Press of Colorado, Boulder. Crumley, Carole, ed. 1994 Historical Ecology. School of American Research Press, Santa Fe, NM. Dugmore, Andrew J., Douglas M. Borthwick, Mike J. Church, Alastair Dawson, Kevin J. Edwards, Christian Keller, Paul Mayewski, Thomas H. McGovern, Kerry-Anne Mairs, and Gulirj4n Sveinbjarnardl_ttir 2007 The Role of Climate in Settlement and Landscape Change in the North Atlantic Islands: An Assessment of Cumulative Deviations in High-Resolution Proxy Climate Records. Human Ecology 35: 169%00178. Fisher, Christopher T., J. Brett Hill, and Gary M. Feinman 2009 The Archaeology of Environmental Change: Socionatural Legacies of Degradation and Resilience. University of Arizona Press, Tucson. Hornberg, Alf, J. R. McNeill, and Joan Martinez-Alier, eds. 2007 Rethinking Environmental History: World System History and Global Environmental Change. Altamira, Lanham, MD. Kirch, Patrick V. 1997 Microcosmic Histories: Island Perspectives on %00Global%00Change. American Anthropologist 99(1): 30%0042. 2007 Hawaii as a Model System for Human Ecodynamics. American Anthropologist 109(1): 8%0026. Kohler, Timothy A., and Sander van der Leeuw, eds. 2007 The Model-Based Archaeology of Socionatural Systems. School of American Research Press, Santa Fe, NM. Marks, Robert B. 2007 The Origins of the Modern World: A Global and Ecological Narrative from the Fifteenth to the TwentyFirst Century, 2nd ed. Rowman and Littlefield, Toronto. McGovern, Thomas H., Orri Vi0steinsson, Adolf Fridriksson, Mike Church, Ian Lawson, Ian A. Simpson, Arni Einarsson, Andy Dugmore, Gordon Cook, Sophia Perdikaris, Kevin Edwards, Amanda M. Thomson, W. Paul Adderley, Anthony Newton, Gavin Lucas, and Oscar Aldred 2007 Landscapes of Settlement in Northern Iceland: Historical Ecology of Human Impact and Climate Fluctuation on the Millennial Scale. American Anthropologist 109(1): 27%0051. Norberg, Jon, James Wilson, Brian Walker, and Elinor Ostrom 2008 Diversity and Resilience of Social-Ecological Systems. In Complexity Theory for a Sustainable Future, ed. Jon Norberg and Graeme S. Cumming. Columbia University Press, New York, pp. 46%0081. Redman, Charles L., Steven R. James, Paul R. Fish, and J. Daniel Rogers, eds. 2004 The Archaeology of Global Change. Smithsonian Institution Press, Washington, DC. Rick, Torben C., and Jon M. Erlandson, eds.
42	14	0	0	0	0	Although the chapter opens by defining institutions as both formal and informal, the review only appears to cover formal institutions. This represents a gap, particularly when discussing local institutions. The chapter could be strengthened by engaging with the literature on the role of local institutions (e.g. Naess, 2012 The role of local knowledge in adaptation to climate change. WIREs Climate Change Vol. 4 (2): 99–106) (Harvey. Blane. IDRC)
43	14	0	0	0	0	In general, chapter 14 is an excellent overview about adaptation needs, options, actors and roles, adaptation assessments, adaptation metrics and monitoring. (Puetz, Marco, Swiss Federal Institute for Forest, Snow and Landscape Research WSL)
44	14	0	0	0	0	In general, very informative, nicely structured chapter. Information well organized. Just a few minor comments. (Alcamo, Joseph, UNEP)

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45	14	0	0	0	0	There is a very strong emphasis on adaptation in developing countries, to the extent that developed country planning is barely mentioned beyond some examples from the US; Europe is not mentioned at all beyond UKCIP's decision making framework. Could this be balanced more by including one or two more case studies from developed countries? The ASC's work in assessing the preparedness of the UK for climate change (focussing very much on incremental adaptation and identifying low-regret options, plus use of indicators for vulnerability, action and residual risk) might be a good one to reference in section 14.6 (measuring adaptation). See http://www.theccc.org.uk/tackling-climate-change/preparing-for-climate-change/ . For a peer reviewed paper, see http://www.oecd-ilibrary.org/environment/national-adaptation-planning_5k483jpfpsq1-en (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
46	14	0	0	0	0	Chapter 14 covers a number of fundamental matters that have important implications throughout the report, and particularly so for chapters 15, 16, 17, and 18, also addressing adaptation. These matters, and arguably serious problems, derive from the definitions of those terms and underlying constructs relating to adaptation in the AR5 glossary, the use of the term adaptation and related terms throughout the report, and the very problematic assumptive world which has led to this situation and gloss of 'adaptation'. (Reser, Joseph, Griffith University)
47	14	0	0	0	0	There are a number of ways in which the problem could be described and explained. These include: 1. The level of analysis problem. In this glossary definition (and in report text definitions) there is no reference to differing levels of analysis, nor do the levels of analysis implied and explicitly referred to in the report include the intra-individual level of analysis which encompasses so many psychological (including biological) considerations, variables, processes, and mediating and moderating factors relating to adaptation behaviours. While there is solid reference to decision making in some parts of the report, this typically relates to very specific paradigms relating to risk and decision-making, and/or to socioeconomic models such as contingent valuation, often at other than individual levels of analysis or processing. It is instructive that there is no individual level of analysis subheading under 14.4, 'Actors and Roles in Adaptation (p 13). (Reser, Joseph, Griffith University)
48	14	0	0	0	0	2. The cross disciplines issue. There seems to be little appreciation by IPCC authors that adaptation is a fundamental construct and suite of processes across many disciplines, including within the social sciences and the humanities, and that reference to and understandings of 'adaptation' and its underlying construct(s) is in many cases very different from this IPCC definition. Yet many social science researchers are addressing human response to the threat of climate change, and using the term and constructs of adaptation in ways which are simply not encompassed or acknowledged by the current glossary entries relating to adaptation, or the text and assumptions of the current draft report. (Reser, Joseph, Griffith University)
49	14	0	0	0	0	3. The cross-disciplinary and policy relevant communication problems The very specific and restricted use of terminology and constructs within IPCC reports leads to multiple communication problems across the climate change sectors and with the public, and policy makers, and administrators and government bodies, and of course communication slippage and breakdown. It also leads to incredible frustration on the part of social scientists for whom these constructs have been fundamental for well over the past century, and who have in fact been undertaking global environmental change research for the past four decades (e.g., Chen, Boulding & Schneider, 1983). Importantly, these differing conceptual and construct specifications and understandings of course lead to very different operationalisations of these parameters and processes, and considerable further confusion and indeed poor science. (Reser, Joseph, Griffith University)

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50	14	0	0	0	0	4. The methodological and measurement problems. The methodologies and measures which the current adaptation definitions imply and invite not surprisingly ignore many crucial aspects of adaptation and adaptation processes. This is dramatically the case with respect to intra-individual variables and processes, which coincidentally include risk perception and appraisal, knowledge and understanding, cognition and emotion, motivational processes, concern and distress, felt efficacy, and psychological adaptation and coping. It is also the case with respect to many extra-individual social psychological processes and dynamics, such as the social construction and the social representation of climate change, the social amplification and attenuation of risk, etc. While the problems of measuring adaptation are canvassed in the chapter, it is telling that this discussion does not address matters relating to psychological adaptation (Reser, Joseph, Griffith University)
51	14	0	0	0	0	These issues reflect a number of convergent problems, such as the disciplinary representation of the authors of the IPCC, the historical hegemony of the natural and physical sciences in this emergent arena, the mistaken belief by many that the social sciences can be adequately represented by socio-economists and human geographers, and the discipline-specific privileging of particular levels of analysis. These converging considerations have effectively and dramatically marginalised the input of psychology as a discipline, and the crucial relevance of an intra-individual level of analysis, as well as many interpersonal, social group, and societal social psychological processes. This virtual absence of an intra-individual level of analysis has effectively meant that an individual level system analysis is largely absent, along with phenomenological analyses and considerations, and indeed all of those psychological processes relating to public risk perceptions, understandings, and intra-individual psychological responses to climate change, with these including, most notably, psychological adaptation and coping, and psychological impacts of the threat of climate change, the physical environmental impacts of climate change, and the psychological impacts of adaptation itself. The relative numbers of IPCC social scientists representing anthropology, political science, psychology, sociology, cultural studies, and media studies, for example, make this point quite dramatically. The running discussion of the inter-twined relationship between adaptation and vulnerability in this chapter also underscores just how impoverished this discussion is without the recognition of subjective exposure and vulnerability, and risk appraisal as distinct from risk assessment, and the reality that 'vulnerability' like adaptation, is and has been a core construct and consideration within psychology and the social sciences generally for the past century, and yet is defined and employed in this and previous IPCC reports as though this longstanding and highly relevant body of psychological work did not exist. (Reser, Joseph, Griffith University)
52	14	0	0	0	0	Sources cited relating to the feedback on chapters commented upon: (References listed in single cells) - Agho, K., Stevens, G., Taylor, M., Barr, M., & Raphael, B. (2010). Population risk perceptions of global warming in Australia, 110(8), 756-763. (Reser, Joseph, Griffith University)
53	14	0	0	0	0	Albrecht, G. (2011). Chronic environmental change: Emerging 'psychoterric' syndromes. In I. Weissbecker (Ed.), Climate change and human well-being: Global challenges and opportunities (pp. 43-56). New York: Springer Publications. (Reser, Joseph, Griffith University)
54	14	0	0	0	0	American Psychological Association Taskforce on the Interface between Psychology and Global Climate Change (2009). Psychology & global climate change: Addressing a multifaceted phenomenon and set of challenges. Washington, DC: American Psychological Association. http://www.apa.org/science/about/publications/climate-change.aspx (Reser, Joseph, Griffith University)
55	14	0	0	0	0	Australian Psychological Society. (2010). Psychology and climate change: A position statement prepared for the Australian Psychological Society. Melbourne, Vic: Author. (Reser, Joseph, Griffith University)
56	14	0	0	0	0	Chen, R.S., Boulding, R & Schneider, S.H. (Eds) (1983) Social science research and climate change: An interdisciplinary appraisal. Dordrecht, The Netherlands: Reidel. (Reser, Joseph, Griffith University)

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57	14	0	0	0	0	Climate Institute (2011). A Climate of Suffering: The real costs of living with inaction on climate change. http://www.climateinstitute.org.au/a-climate-of-suffering.html (Reser, Joseph, Griffith University)
58	14	0	0	0	0	Evans, G.W. & Stecker, R. (2004) Motivational consequences of environmental stress. <i>Journal of Environmental Psychology</i> , 24, 143-165. (Reser, Joseph, Griffith University)
59	14	0	0	0	0	Evans, G.W. ((1984) Environmental stress. Cambridge, NY: Cambridge University Press. (Reser, Joseph, Griffith University)
60	14	0	0	0	0	Folkman, S. (Ed), (2011). The Oxford handbook of stress and coping. New York: Oxford University Press. (Reser, Joseph, Griffith University)
61	14	0	0	0	0	Fritze, J. G., Blashki, G. A., Burke, S., & Wiseman, J. (2008). Hope, despair and transformation: Climate change and the promotion of mental health and wellbeing. <i>International Journal of Mental Health Systems</i> , 2. Available from http://www.iimhs.com/content/pdf/1752-4458-2-13.pdf (Reser, Joseph, Griffith University)
62	14	0	0	0	0	Gow, K. (Ed) (2009). Meltdown: Climate change, natural disasters, and other catastrophes – Fears and concerns of the future. New York: Nova Science Publishers. (Reser, Joseph, Griffith University)
63	14	0	0	0	0	Hamilton, C. (2010) Requiem for a species. Sydney: Allen & Unwin. (Reser, Joseph, Griffith University)
64	14	0	0	0	0	Hughes, L. & McMichael, T. (2011). The Critical Decade: Climate change and health. Climate Commission, Commonwealth of Australia (Department of Climate Change and Energy Efficiency). http://climatecommission.gov.au/report/the-critical-decade-climate-change-and-health (Reser, Joseph, Griffith University)
65	14	0	0	0	0	Marshall, R.D., Bryant, R.A., Amsel, L., Suh, E.J., Cook, J.M., & Neria, Y. (2007) The psychology of ongoing threat: Relative risk appraisal, the September 11 attacks, and terrorism-related fears. <i>American Psychologist</i> , 62 (4) 304-316. (Reser, Joseph, Griffith University)
66	14	0	0	0	0	Morrissey, S. A., & Reser, J. P. (2007). Natural disasters, climate change and mental health considerations for rural Australia. <i>Australian Journal of Rural Health</i> , 15, 120-125. (Reser, Joseph, Griffith University)
67	14	0	0	0	0	Reser, J. P., & Swim, J. K. (2011). Adapting to and coping with the threat of climate change. <i>American Psychologist</i> , 66, 277-289. (Reser, Joseph, Griffith University)
68	14	0	0	0	0	Reser, J.P., Bradley, G.L., Glendon, A.I., Ellul, M.C. & Callaghan, R. (2012a) Public risk perceptions, understandings, and responses to climate change and natural disasters in Australia and Great Britain. Gold Coast, Qld: Griffith University, National Climate Change Adaptation Research Facility. www.nccarf.edu.au/publications/public-risk-perceptions-final (Reser, Joseph, Griffith University)
69	14	0	0	0	0	Reser, J.P., Bradley, G.L., Glendon, A.I., Ellul, M.C. & Callaghan, R. (2012b) Public risk perceptions, understandings and responses to climate change and natural disasters in Australia: 2010-2011 national survey findings. Gold Coast, Qld: National Climate Change Adaptation Research Facility. www.nccarf.edu.au/publications/public-risk-perceptions-second-survey (Reser, Joseph, Griffith University)
70	14	0	0	0	0	Reser, J.P., Bradley, G.L. & Ellul, M.C. (2012c) Coping with climate change: Bringing psychological adaptation in from the cold. In B. Molinelli & V. Grimaldo (Eds) <i>Handbook of the psychology of coping: Psychology of emotions, motivations and actions</i> (pp 1-34). New York, NY: Nova Science Publishers. (Reser, Joseph, Griffith University)
71	14	0	0	0	0	Reser, J. P., & Morrissey, S. A., & Ellul, M. C. (2011). The threat of climate change: Psychological response, adaptation, and impacts. In I. Weissbecker (Ed.), <i>Climate change and human well being. International and cultural psychology series</i> (pp. 19-42). New York: Springer Publications. (Reser, Joseph, Griffith University)
72	14	0	0	0	0	Reser, J.P. & Bentrupperbäumer, J.M. (2008) Framing and researching the impacts of visitation and use in protected areas. In N. Stork & S. Turton (Eds) <i>Living in a dynamic tropical forest landscape: Lessons from Australia</i> (pp 420-429). Oxford, UK: Blackwell Publishing. (Reser, Joseph, Griffith University)

#	Ch	From Page	From Line	To Page	To Line	Comment
73	14	0	0	0	0	Reser, JP. & Bentrupperbäumer, JM. (2001). Reframing the nature and scope of social impact assessment: A modest proposal relating to psychological and social (psychosocial) impacts. In A. Dale, N. Taylor, & M. Lane (Eds) Social assessment in natural resource management institutions (pp 106-122). Collingwood, Victoria: CSIRO Publications. (Reser, Joseph, Griffith University)
74	14	0	0	0	0	Searle, K., & Gow, K. (2009). Exploring the psychological aspects of risk, fears, and concerns about climate change. In K. Gow (Ed.), Meltdown: Climate change, natural disasters, and other catastrophes – Fears and concerns of the future (pp. 31-54). New York: Nova Science Publishers. (Reser, Joseph, Griffith University)
75	14	0	0	0	0	Searle, K., & Gow, K. (2010). Do concerns about climate change lead to distress? International Journal of Climate Change Strategies and Management, 2(4), 362-379. (Reser, Joseph, Griffith University)
76	14	0	0	0	0	Although containing some very important ideas, I find chapter 14 very difficult to read, badly balanced and not in line with the other chapters of the report. I think this is due to the broad definition of adaptation needs which lead to a non-intuitive structure of the chapter. While there are reasonable arguments why all these institutional, social and resource aspects might be considered adaptation needs, it makes the chapter feel overly loaded with contents that cannot be dealt with adequately and causes an unclear structure. Also looking at the Plenary Approved Outline this seems not to have been the intention for this report. It seems to me that adaptation needs and options exclusively refer to what in chapter four are collected under structural and concrete options, this would then go well with the other proposed sub-sections of the approved outline: International, national, and sectoral assessments, including National Adaptation Programmes of Action (NAPAs) Measuring adaptation Addressing maladaptation Furthermore, many aspects that are superficially mentioned in chapter 14 are much more in depth dealt with in chapter 15 (I do not think that chapter 14 should be largely a pre- and overview for chapter 15, which it currently is to a large extent). Finally, as I mentioned in comments on the entire report, it does not support the consistent use of adaptation needs/options across the report. (Hanger, Susanne, International Institute for Applied Systems Analysis)
77	14	0	0	0	0	If the current structure of this chapter is maintained (although I do not consider that a good idea), I think it is at least important to highlight much more the cases where adaptation needs are about enhancing adaptive capacities and where we are talking about direct adaptation measures as an immediate response to climate impacts; Also it should be highlighted that while increasing adaptive capacity in the developing world is highly relevant, in developed countries this might be less pressing (Hanger, Susanne, International Institute for Applied Systems Analysis)
78	14	0	0	0	0	The authors are to be congratulated for significant improvements in the chapter since the FOD. (Ebi, Kristie, ClimAdapt, LLC)
79	14	0	0	0	0	The chapter makes several references to the importance of ensuring flexibility when developing and deploying adaptation options. This is certainly critically important. In addition, it is important for the chapter to discuss the need for iterative management. There are multiple places in the chapter where it would be helpful to discuss changing adaptation needs over time, and what that means for options, assessment, and measurement. (Ebi, Kristie, ClimAdapt, LLC)
80	14	0	0	0	0	The definition of vulnerability used in the chapter is not consistent with the glossary. (Ebi, Kristie, ClimAdapt, LLC)
81	14	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 14 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. (Chatterjee, Monalisa, IPCC WGII TSU)
82	14	0	0	0	0	The chapter is evolving very well. Some revisions may be required to connect the chapter with the rest of the report. (Chatterjee, Monalisa, IPCC WGII TSU)
83	14	0	0	0	0	Author team should ensure that calibrated uncertainty language is used only to make probabilistic statements. (Chatterjee, Monalisa, IPCC WGII TSU)

#	Ch	From Page	From Line	To Page	To Line	Comment
84	14	0	0	0	0	The chapter has rich discussions on several interdependent topics. For FGD preparation, authors may wish to synthesize key messages in tables or in form of other synthetic elements as 'finding rich capsules' that people can use from this assessment. (Chatterjee, Monalisa, IPCC WGII TSU)
85	14	0	0	0	0	1) Overall -- The chapter team has developed a robust and compelling 2nd-order draft. In the final draft, the chapter team is encouraged to continue its prioritization of compact and rigorous assessment, clear writing, and strong nuance. (Mach, Katharine, IPCC WGII TSU)
86	14	0	0	0	0	2) Coordination across Working Group II -- In developing the final draft of the chapter, the author team should continue to ensure coordinated assessment, both in the chapter text and at the level of key findings. In particular, the coverage of and handoffs among the adaptation chapters should continue to be refined. Where cross-references are made, they should ideally refer to specific sections of other chapters and/or their assessment findings, reducing overlaps and harmonizing assessment. (Mach, Katharine, IPCC WGII TSU)
87	14	0	0	0	0	3) Harmonization with the Working Group I contribution to the AR5 -- In developing the final draft, the chapter team should also ensure all cross-references to the Working Group I contribution are updated, with discussion of climate, climate change, and climate extremes referencing the assessment findings in that volume. (Mach, Katharine, IPCC WGII TSU)
88	14	0	0	0	0	4) Attention to figure suggestions received in the review -- If reviewers of the chapter identify potential graphics that would complement the text of the chapter and enhance the assessment, the chapter team is strongly encouraged to consider them. (Mach, Katharine, IPCC WGII TSU)
89	14	0	0	0	0	5) Characterization of future risks -- In assessing adaptation needs and options, the chapter team may wish to consider risks of climate change for what can be considered two eras. Some risks become relevant in the next few decades, during which time projected temperatures do not vary substantially across socioeconomic/climate scenarios. These coming decades can be considered an era of climate responsibility, and adaptation can be considered a primary means of reducing risks during this time. In contrast, mitigation choices made now and in the coming decades will be important in determining the level of climate change realized in the 2nd half of the 21st century and beyond. This longer-term period can be considered an era of climate options. Mitigation and adaptation are both relevant for risk reduction over this time frame. (Mach, Katharine, IPCC WGII TSU)
90	14	0	0	0	0	6) 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 consideration of future risks, the chapter team is encouraged to consider themes emerging across chapters, for example the importance of extreme events in understanding adaptation deficits and vulnerabilities to date, as well as future risks and potential responses, the role of limits to adaptation and transformation, the relevance of multidimensional inequality in the context of climate change, understanding of adaptation experience to date, and the nature of interactions among mitigation, adaptation, and sustainable development. The author team is also encouraged to further coordinate its table of adaptation options (table 14-2) with other chapters, potentially introducing a variety of entry points as done in table SPM.3 currently. (Mach, Katharine, IPCC WGII TSU)
91	14	0	0	0	0	7) Report release -- The chapter team should be aware that the final drafts of the chapters will be posted publicly at the time of the SPM approval, before final copyediting has occurred. Thus, the chapter team is encouraged to continue its careful attention to refined syntax and perfected referencing. (Mach, Katharine, IPCC WGII TSU)
92	14	0	0	0	0	GENERAL COMMENTS: I congratulate the author team for all their work on an interesting and informative SOD, including a clearly traceable executive summary. Please see my detailed comments for a small number of suggestions related to ES findings and traceable accounts and specific clarifications. (Mastrandrea, Michael, IPCC WGII TSU)

#	Ch	From Page	From Line	To Page	To Line	Comment
93	14	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 14, relevant sections include presentation of observed impacts and vulnerabilities in section A.i, adaptation experience in section A.ii, iterative management of risk in section B.i, principles for effective adaptation in section B.ii, and transformation in section D.i and Box SPM.7/TS.10, as well as related figures and tables. 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 14 and other chapters at LAM4? (Mastrandrea, Michael, IPCC WGII TSU)
94	14	0	0	0	0	General comments:1) It had better have a section or subsection to assess cost-benefit of adaptation. 2) Several sections discribe "what they (needs, options,anctors and roles, etc.) are" but lack "how they work". (Shaohong, Wu, Chinese Academy of Agricultural Sciences)
95	14	0	0	0	0	Another non Chapter. Says nothing (Gray, Vincent, Climate Consultant)
96	14	1	0	2	0	The chapter deals with adaptation needs and options. Options are defined as the array of strategies and measures available and appropriate to address needs. How the appropriateness is defined is not very clear. The chapter does not deal with evaluation of adaptation options, even though monitoring and evaluation are central in planning. Evaluation is partly dealt with in several sections of Chapter 14 : subsection on selecting adaptation options, section on assessments, section on maladaptation. However, as evaluation is a key issue in planning and implementation of adaptation and would merit a section of its own, either in chapter 14 or in chapter 15.. (Kankaanpää, Susanna, Helsinki Region Environmental Services Authority (HSY))
97	14	2	24	0	0	This chapter assesses adaptation needs and options. But in its ES, there is no conclusion on “needs for adaptation technologies”. It is suggested that a conclusion on needs for adaptation technologies be added in the ES based on 14.3.5. (CHINA)
98	14	2	24	0	0	Executive Summary -- The chapter team is encouraged to consider sections A.ii and B of the SPM in further revising the executive summary. The key findings of chapter 14 have played an important role in framing material within those sections of the SPM, and the chapter team could further consider if there are any gaps in the assessment findings within the SPM that could be filled through further attention to them in the chapter 14 executive summary, based on the chapter's assessment. (Mach, Katharine, IPCC WGII TSU)
99	14	2	24	2	24	The ES should also describe the convergence of DRR and CCA in policy, planning and practice; it should also highlight the increasing effort on delivering resilient development outcomes (Hay, John, University of the South Pacific)
100	14	2	26	2	27	The changed emphasis concerning vulnerability not only concerns the drivers by also the ability to responsd (i.e. adaptive capcity) (Hay, John, University of the South Pacific)
101	14	2	26	2	29	This paragraph reflects a change in the focus of the IPCC report that, in our view, might represent a weakness instead of a strength. Moving from the primary link of climate change with the specific vulnerability it causes to a general concept of 'vulnerability', wherever the root of the problem might be, can be misleading. The need to deal with climate change integrated with other challenges should not lead the IPCC to miss the focus on climate, climate sciences, climate stressors, etc. The new definition of culnerability, delinking it from climate change, is significant of this process. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
102	14	2	26	3	31	Please mention the role of international cooperation in the Exec Summary as the UNFCCC is the main addressee of the IPCC. (GERMANY)

#	Ch	From Page	From Line	To Page	To Line	Comment
103	14	2	27	2	29	What I miss in this point of the summary is the role of institutions. I am not aware of research on the influence of the political system on vulnerability. (Pauw, Willem Pieter, German Development Institute (DIE))
104	14	2	29	2	29	This broader definition of adaptation is positive, but leads to an increased complexity of definitions. We suggest inserting new text along the lines of "The move to this wider approach leads to increased complexity of definitions. As a consequence of this shift the number of terms and concepts employed in this field has increased, with some consensus but also some overlap and contest in terminology. There is also increasing recognition of the complexity of adaptation as a policy challenge; it is value-laden, highly politicized, and adaptation needs vary according to the climate impact and time frame being considered." (Rissik, David, Griffith University)
105	14	2	31	0	0	Presumably there will be no discussion here of shifts at some point towards a less consumer-based and energy intensive model of society should these tech and engineered approaches be found wanting or too risky (in fact maladaptation) - presuming while there is still time to consider alternative action? (Bunce, Matthew, Institute of Marine Engineering, Science and Technology)
106	14	2	31	2	31	To change the word 'but' as 'although', the reason for the change is because if we use 'but', it seems that the 'engineered and technological adaptation options' are getting weaker, actually they are still very important, so we would use 'although' to express the meaning that the 'engineered and technological adaptation options' are still very important, though we have more attentions on the institutional and social measures. (Xu, Yinlong, Institute of Environment and Sustainable Development in Agriculture (IEDA), Chinese Academy of Agricultural Sciences (CAAS))
107	14	2	31	2	33	Important statement that we did not see in the Summary for Policymakers (NETHERLANDS)
108	14	2	31	2	33	The construction of the sentence is quite passive ("an emphasis continues to be placed"). Possibly a stronger statement could be made to emphasize what the chapter team has concluded in its assessment. (Mach, Katharine, IPCC WGII TSU)
109	14	2	31	2	37	This paragraph contradicts the statement on win-win, no-regrets etc. as the adaptation attracting most attention in the past. Engineered solutions are the opposite. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
110	14	2	31	2	37	Here is found no information on adaptation needs. It is suggested to add at the end of this paragraph the following: "In order to effectively adapt to climate change, all countries, especially developing ones, have many additional needs, including institutional arrangements, finance, technology and capacity building". (CHINA)
111	14	2	34	2	34	Change the sentence "Integration, while it remains a challenge, streamlines..." (Rissik, David, Griffith University)
112	14	2	34	2	36	Integrating adaptation in wider policy frameworks is not easy at all, particularly in developing countries. I would either include the word 'successful' in front of adaptation, or weaken the statement by stating that integration CAN help to avoid mismatches etc etc. (Pauw, Willem Pieter, German Development Institute (DIE))
113	14	2	34	2	36	As a note, the chapter team reworded this statement for the summary for policymakers in response to other authors asking "integration of what." It would be preferable to clarify the statement here as well, including mention of mainstreaming. For reference, the reworded statement within the summary for policymakers was: "Mainstreaming facilitates integration of adaptation into planning and decision-making and embeds climate-sensitive thinking in existing and new institutions and organizations (high confidence)." (Mach, Katharine, IPCC WGII TSU)
114	14	2	36	2	37	Last sentence needs to be broadened to include, suggest insert ", policy objectives" after planning (Rissik, David, Griffith University)
115	14	2	37	2	37	Institutional learning should be emphasized stronger. Add: "The ability of institutions to learn is of crucial importance for effective adaptation decisions and actions." See Chapter 14, P 6 L 5-14 The ability of institutions to learn is of particular importance with regard to cc adaptation and should be emphasized stronger. (GERMANY)
116	14	2	39	2	39	Also no regrets and also enhancing the resilience of development outcomes (Hay, John, University of the South Pacific)

#	Ch	From Page	From Line	To Page	To Line	Comment
117	14	2	39	2	41	The term "cost" in this sentence is unclear: this could be to minimizing the cost of the adaptation option or future costs associated with the impact that is to be avoided (or both). (UNITED STATES OF AMERICA)
118	14	2	39	2	46	I think that what lacks here is a discussion of the trade-offs between incremental and transformational adaptation. Kates discusses some of the feasibility problems that might be related to transformational adaptation which should be included in this chapter Kates, R. W., W. R. Travis, and T. J. Wilbanks. 2012. Transformational adaptation when incremental adaptations to climate change are insufficient. Proceedings of the National Academy of Sciences 109:7156-7161. (Dupuis, Johann, Swiss Graduate School of Public Administration (IDHEAP))
119	14	2	39	2	46	This paragraph is completely unclear (and then moved to SPM). The concept of transformative changes should be clarified or removed. It is not clear why no-regrets, win-win, etc. Is confronted with continuing uncertainty. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
120	14	2	39	2	46	Is there some indication as to transformative changes mean for the necessary adaptive capacity? It would be useful to reflect this here and/or in the text. (Street, Roger B, Oxford University)
121	14	2	41	0	44	This sentence seems to imply that no-regret, low-regret, and win-win strategies are adaptation options of the past but as discussed in Chapter 15 (page 3 lines 21-23), they have been and still are effective strategies, especially in developing countries; and therefore, the sentence should be revised to avoid misunderstanding. (JAPAN)
122	14	2	44	0	0	Suggest at end of sentence "its impacts" insert following text "and there can be limits to adaptation." (Rissik, David, Griffith University)
123	14	2	44	2	44	Adequate adaptation also needs to consider how vulnerability will change with development. (Ebi, Kristie, ClimAdapt, LLC)
124	14	2	46	2	46	Some crucial factors for motivating adaptation strategies or measures are listed, but the idea of climate resilience as a long-term objective is still missing. We suggest to add (in Executive Summary of Ch. 14 P 2 L 46; TS P 48 L 13 and SPM P 5 L 14): "With regard to the objectives of transformative changes it is asserted from a development context that "For example, in a development context resilience 'evokes positive and broad development goals (e.g., education, livelihood improvements, food security), includes multiple scales (temporal and spatial) and objectives, better captures the complex interactions between human societies and their environments, and emphasizes learning and feedbacks' (Moss et al., to appear)." Source: Chapter 14, P 20 L 45-48. (GERMANY)
125	14	2	48	0	0	should be changed to " among many actors" (VIETNAM)
126	14	2	48	2	50	Local authorities and private enterprises are indeed essential to progress to be made in adaptation. But the important role played by the international community in helping developing countries to enhance climate change adaptability cannot be ignored either. It is suggested to add relevant information in the ES based on 14.4.4. (CHINA)
127	14	2	48	2	54	If the national government does nothing to support climate adaptation, 99% of local governments and private companies will do nothing either. There has to be a balance. (NETHERLANDS)
128	14	2	48	3	3	This text implies that local approaches to adaptation are the complete answer. Suggest insert somewhere in this paragraph "There are some adaptation problems that need to be dealt with at the larger scale." (Rissik, David, Griffith University)
129	14	2	48	3	3	The Executive Summary should accurately summarize the overarching findings of the chapter, and highlight some particularly important or new findings. But the Executive Summary is not always successful at this. For example, the section that deals with roles of actors highlights locals and private industry, but the section in the report emphasizes the importance of a range of actors. In addition, the section in the report does not seem to focus so much on private entities as the executive summary. There needs to be a more balanced presentation in the Executive Summary. (UNITED STATES OF AMERICA)

#	Ch	From Page	From Line	To Page	To Line	Comment
130	14	2	49	2	49	The term "progress" needs a qualifier. Social progress? Progrees to avoid dangerous climate change? What is progressing? (Rosales, Jon, St. Lawrence University)
131	14	2	49	2	49	It is not just the governance role of these local actors (Hay, John, University of the South Pacific)
132	14	2	50	2	52	In the United States, many local governments are still relying on Federal agencies to translate the top-down flow of risk information. Suggest changing language to something along the lines of "These two groups will bear significant/increasing responsibility for translating the top-down flow of risk information..." (UNITED STATES OF AMERICA)
133	14	2	54	54	2	I would separate the two motivations of the private sector to engage in adaptation: on the one hand they have to protect their assets and production systems to stay in business or the prevent losses (mainstreaming); on the other hand climate change adaptation offers new markets and business opportunities. We touch upon this issue in a forthcoming publication in Climate and Development (2nd draft under review) (Pauw, Willem Pieter, German Development Institute (DIE))
134	14	3	0	0	15	Authors should ask themselves whether coining new terms (eg 'adaptation bottleneck' and 'adaptation paradox') is adding that much value, , or making the knowledge more complex. (Parry, Martin, Imperial College)
135	14	3	1	0	0	"seek to protect" and "perhaps even enhance". (UNITED STATES OF AMERICA)
136	14	3	1	3	2	Is this not also true of local government (i.e. the need for systematic connected thinking)? (Street, Roger B, Oxford University)
137	14	3	1	3	3	Further, their short-term nature may not be adaptive in the longer-term. (Ebi, Kristie, ClimAdapt, LLC)
138	14	3	1	5	36	What is the rapid pace that indicates we must adapt. Avoid using rapid. We can adapt or not and there will be consequences either way. Adaptation should not be spoken to as a necessity. Adaptation is a value judgement amongst many other value judgements of weighing risks with the benefits and resources available. This chapter should begin with the premise that when adaptation is identified as a course of action that the informational needs be met to achieve the goals of adaptation; as opposed to adaptation is necessary. (UNITED STATES OF AMERICA)
139	14	3	2	0	0	Insert word "biodiversity" between the words "with" and "government" (Rissik, David, Griffith University)
140	14	3	2	3	3	Not just government, but may not align with larger scale (e.g., national government) or community priorities/objectives (Street, Roger B, Oxford University)
141	14	3	5	3	8	Summary statement needs to be qualified. After word "evolve" insert text "and where they are undertaken, lead" delete "leading" (Rissik, David, Griffith University)
142	14	3	5	3	8	For this statement, the chapter team is encouraged to consider the revised formulation it provided for the summary for policymakers, as the 3rd paragraph of A.ii (page 5, lines 20-25, of the draft SPM). (Mach, Katharine, IPCC WGII TSU)
143	14	3	5	3	15	Awareness of adaptation needs might be raising among decision makers, but adaptation is still far from being defined as a priority which clearly hampers implementation (Dupuis, J. and P. Knoepfel. 2011. Les barrières à la mise en oeuvre des politiques d'adaptation au changement climatique: le cas de la Suisse. Revue suisse de science politique 17. Dupuis, J. and P. Knoepfel. 2011. Political Barriers to the Implementation of Climate Change Adaptation Policies: How Does The Political Framing of Climate Change Affect Decision Making in the Case of Switzerland. IGS-SENCE Conference Resilient Societies - Governing Risk And Vulnerability For Water, Energy And Climate Change, University Of Twente, Enschede, The Netherlands. (Dupuis, Johann, Swiss Graduate School of Public Administration (IDHEAP))
144	14	3	5	3	15	We did not read this in the Summary for Policymakers. It contradicts the overly postive statements that we mentioned for Summary page 7 (from line 31 to 55) and p 8 (line 23) (NETHERLANDS)
145	14	3	5	3	15	Is there a clearly articulated business case for adaptation (more than just adaptation works)? Can we make the link between adaptation and economic growth and jobs? (Street, Roger B, Oxford University)

#	Ch	From Page	From Line	To Page	To Line	Comment
146	14	3	6	0	0	Alter sentence to say "However these assessments are not often translated...." (Rissik, David, Griffith University)
147	14	3	6	3	12	This paragraph of the executive summary suggests that one barrier to greater integration arises from different terminologies. This point is not very clearly developed in the chapter subsequently. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
148	14	3	10	3	12	Given that risk is thought of in the context of the report as determined by the interaction of changes in the physical climate system with the vulnerability and exposure of systems, it would be useful to consider the terminology here. In line 11 when you refer to "biophysical climate change risks" I think you are referring specifically to the "biophysical climate changes" themselves (a component of risk). Then, on line 12, I would again refer to "changes" instead of "risks" (because vulnerability is also a component of risk) and then "risks" instead of "hazards" later in the line. (Mastrandrea, Michael, IPCC WGII TSU)
149	14	3	11	0	0	Insert "and natural systems" after people (Rissik, David, Griffith University)
150	14	3	12	0	0	Unecessary terminology. Suggest remove " (the 'adaptation paradox')" (Rissik, David, Griffith University)
151	14	3	13	3	15	This sentence is not clear. Is there an "and" that should be an "are"? (Harvey, Blane, IDRC)
152	14	3	14	3	15	while it makes logical sense that assessments that are linked more directly to particular decisions and provide information to facilitate the decisions will help overcome the adaptation bottleneck there must be a decision process to plug into. Many adaptation measures must be "triggered" by some entity whether it be local or national government, amongst others. These decision processes must be started by something and likely not a localized impact assessment as it wouldn't have been funded to do that. (UNITED STATES OF AMERICA)
153	14	3	15	3	15	Close the square bracket "[" in [14.5.3] (CANADA)
154	14	3	17	3	21	Call for enhanced adaptive capacity to address both synergies and conflicts, including the development of indicators/metrics to measure adaptive capacity and to evaluate that capacity (Street, Roger B, Oxford University)
155	14	3	17	3	23	Discussion on adaptation effectiveness, metrics and evaluation might include this interesting forthcoming paper Ford, J. D., L. Berrang-Ford, and A. Lesnikowski. Forthcoming. How to track climate change adaptation: A typology of approaches for national-level application. Ecology and Society. (Dupuis, Johann, Swiss Graduate School of Public Administration (IDHEAP))
156	14	3	18	3	22	Authors use both terms: metric and indicator. Footnote top of page 20 says these terms are interchangeable. It would, therefore, be better to use one term consistently throughout. Reviewer has a preference for "indicator", but whichever is chosen should be used consistently throughout chapter. Throughout the text where the authors use the term 'metric' they probably mean 'measures', and it would be better is so if they used this word. (Rissik, David, Griffith University)
157	14	3	21	3	21	The introductory section to section 14.6 is also relevant here. (Mastrandrea, Michael, IPCC WGII TSU)
158	14	3	23	0	0	recommend to change to " the extent to targeted changes which are occurring" (VIETNAM)
159	14	3	25	3	31	Sometimes, full range of interactions may not be known. Maladaptation could occur by accident as would be evidenced as research, understanding and monitoring improves. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
160	14	3	25	3	31	Maladaptation should also include over adaptation e.g. Where action has been taken that does not weigh up in terms of costs and benefits related to the scale of risk. (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
161	14	3	25	3	31	For this paragraph, the chapter team is encouraged to consider the revised formulation it provided for the summary for policymakers, as the last paragraph of B (page 8, lines 2-6, of the draft SPM). (Mach, Katharine, IPCC WGII TSU)
162	14	3	25	3	31	Note the lack of a systems approach to adaptation planning can also lead to maladaptation (Street, Roger B, Oxford University)

#	Ch	From Page	From Line	To Page	To Line	Comment
163	14	3	36	0	0	We also must adapt because of the time lag in realising the benefits of any mitigation actions; worth including as it's a crucial point. (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
164	14	3	36	3	36	Delete the first sentence of the paragraph. This sentence does not contain any relevant information. You should make it at least slightly longer by explaining that even if with a complete stop of all emissions due to the slow reaction of the climate system, temperature would continue to increase... (GERMANY)
165	14	3	36	3	36	The first sentence of the paragraph should be revised to be more clear (VIETNAM)
166	14	3	36	3	36	What is meant in the 1st sentence could be clarified. Is the chapter team referring to the current rapid pace of climate change, the rapid pace of climate change that is locked in over the next few decades, the pace of climate change that would be seen in the 2nd half of the 21st century across scenarios, etc.? A slightly more specific indication here would make a more powerful opening. (Mach, Katharine, IPCC WGII TSU)
167	14	3	36	3	46	It is useful to talk about planned and unplanned adaptation. Planned and unplanned adaptation measures are important concepts for readers to understand. There are two major problems with this paragraph. First, while it is fine and important to discuss "natural systems" and "human systems", people who manage "places" are well aware that the dividing line between natural and human is not as clear cut. Authors need to also explicitly recognize in this section - through a qualifier sentence for example - that the natural and humans systems are intertwined and successful management and adaptation actions take advantage of that. [For example: 1) the river that runs through a city and floods people's homes. 2) green infrastructure to manage stormwater 3) successful programs for protection of biological diversity and ecological systems in developing countries often implement management activities that explicitly recognize and support the needs of the local (sometimes indigenous) peoples who live in and depend on these systems.] More nuance is provided later in the paper, but it is lost in this paragraph and is a missed opportunity to provide appropriate context. The second and more troubling problem with the presentation of planned and unplanned is that the paragraph generalizes, to the point of being inaccurate, that "natural systems have the potential to adapt through evolutionary processes" and "adaptation in human systems requires intentionality". While there are examples where both of these statements are true, there are also examples where both of these statements are false. The authors need to decouple the planned and unplanned from natural and human. Of particular concern is the sentence that states that a natural systems potential to adapt is primarily through evolutionary processes. Government and many other actors are committing resources to adaptation activities for natural systems through resource management programs, particularly because they have found that evolutionary processes are not adequate for adaptation. This is addressed better later in the paper (page 7 comes to a different and more correct conclusion), but these sentences here are problematic. Likewise, the literature does not conclude that humans systems adaptation are inherently "intentional" and in fact a major priority in government adaptation efforts is to move communities from unplanned to "intentional" adaptation efforts. (The line on "coping behaviors" seems to be an attempt to describe the fact that there is "unplanned" adaptation in human systems. The last sentence regarding adaptation "initiatives" applies equally to human and natural settlements.) Again, these structures of planned/unplanned human (or built environment) and natural are useful constructs for considering adaptation, but the presentation in this paragraph should be improved. (UNITED STATES OF AMERICA)
168	14	3	36	4	21	The last paragraph in Section 1 Introduction should be made the first paragraph of this section, as it explains the purpose of this section. (UNITED STATES OF AMERICA)
169	14	3	37	3	39	This definition of adaptation feels like should be at the beginning of the executive summary. Suggest that it also be in the executive summary as this is the first of 4 adaptation chapters (Rissik, David, Griffith University)

#	Ch	From Page	From Line	To Page	To Line	Comment
170	14	3	37	3	39	This seems like an unnecessary distinction - not sure that it adds much. The move to analysis at the level of socio-ecological systems in the resilience literature (for example) suggests systemic approach is more fruitful. (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
171	14	3	39	3	40	The report stresses the distinction between human and natural systems as a link to differences in planned and unplanned adaptation. Is this really true and in line with the Social Ecological Systems literature in journals such as Ecology and Society which is full of adaptation research? (Puetz, Marco, Swiss Federal Institute for Forest, Snow and Landscape Research WSL)
172	14	3	39	3	46	The concept is fine, but expressed in a muddled, poorly-structured way. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
173	14	3	41	3	41	Adaptation of natural systems (in the climate adaptation world) is not the same thing as evolutionary adaptation. For example, shifts in species ranges can occur within a relatively short timeframe, but unless this is associated with heritable changes in a population or species, it is not evolutionary adaptation. This needs to be corrected and clarified. Most natural resource management adaptation focuses on what humans (e.g. managers) can do to reduce climate-related impacts to natural systems and to increase the resiliency of these systems in a changing climate. (UNITED STATES OF AMERICA)
174	14	3	41	3	41	Where "evolutionary processes" are referred to, would it be most accurate to also mention ecological processes that are adaptive (range shifts, phenology shifts, etc.)? (Mach, Katharine, IPCC WGII TSU)
175	14	3	42	0	0	We don't agree that "adaptation in human systems requires intentionality," and there is no evidence provided that supports this statement. Intentionality may be a factor in adapting to expected future changes, but not necessarily for adapting to actual changes. In fact, in line 43, chapter states that "Coping behavior remains common." Coping is not necessarily intentional. The definition of adaptation does not state that intentionality is important. We suggest modifying this sentence to read "Adaptation in human systems can include intentionality, which results from planned efforts to address needs and advance options." (UNITED STATES OF AMERICA)
176	14	3	42	3	43	We don't agree with this sentence, it assumes that all adaptation in human systems is planned and excludes autonomous adaptation in human systems. Recommend change sentence to "In contrast, planned adaptation requires intentionality" (Rissik, David, Griffith University)
177	14	3	42	3	43	The report points out that adaptation in human systems is the result of planned efforts to address needs and advance options. I would consider this view of human systems and planning as rather naive. Rather, adaptation planning and policy making is full of politics, power issues etc. Also, as natural systems, human systems are evolutionary processes, heavily affected by path dependencies and institutional lock ins. (Puetz, Marco, Swiss Federal Institute for Forest, Snow and Landscape Research WSL)
178	14	3	42	3	43	Do not agree that adaptation in human systems is always planned; e.g. Physiological adaptation to heatwaves is unconscious. Could correct just by re-phrasing "in contrast, anticipatory adaptation by...." (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
179	14	3	42	3	46	The statement "In contrast,... requires intentionality..." suggests human systems do not have an innate ability to adapt or evolve in response to change, such as natural systems do. Is this the correct interpretation? Has the overall AR5 report explained the difference between reactionary adaptation and coping? If so, referencing that section here would be useful. Intentionality is required for proactive adaptation: perhaps this statement could be clarified. (CANADA)
180	14	3	43	0	0	Coping behaviour should still be included as an adaptation behaviour. We wonder if this term is being used in place of autonomous adaptation. We don't agree that this would be a useful change. (Rissik, David, Griffith University)

#	Ch	From Page	From Line	To Page	To Line	Comment
181	14	3	44	3	44	Given the terminology of the special report on extremes, it would perhaps be preferable to use the phrase "extreme weather and climate events" rather than "natural hazards and other extreme events." If extremes other than extreme weather and climate events are meant, it would be best to indicate them more specifically. (Mach, Katharine, IPCC WGII TSU)
182	14	3	45	3	46	The intent or purpose of this sentence is unclear in the context of the paragraph it is in. In particular, what is meant by "planned mode of adaptation"? (UNITED STATES OF AMERICA)
183	14	3	48	0	0	Negotiations - for what and for who and by whom? There is a tendency throughout the chapter to assume certain knowledge on the part of the reader - this is an example. (Rissik, David, Griffith University)
184	14	3	48	3	49	Discussion of incremental and transformational is understandable, however, another way to refer to incremental is adaptive management, which is not discussed at all in this chapter. Adaptive management is a concept that could facilitate the communication and education process for practitioners looking to implement adaptation. Choice of terms and semantics can be a powerful tool or hindrance to adaptation. (UNITED STATES OF AMERICA)
185	14	3	48	3	49	Is there really a need to differentiate between incremental and transformational? Choosing adaptation actions is a spectrum of intensity, in which everyone would start with no change, if possible, then incremental change to the extent that it suits their risk situation, then considering transformational changes when faced with dire choices. Raises question as to whether this paper is about theoretical perspectives on adaptation, on assessment of potential needs, about implementation?? (UNITED STATES OF AMERICA)
186	14	3	48	3	54	Transformational adaptation, changing fundamental attributes, changes in perception and paradigms.... This concept is totally unclear. What does it really mean? (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
187	14	3	48	4	4	Text appears to be missing. Agree it is important to discuss instrumental and transformational but this section is not describing the two clearly. For example, the sentence "It includes not just changes in activities such as changing from cropping to livestock or migrating to take up cropping elsewhere, but also changes in our perception and paradigms about the nature of climate change." is confusing. It seems that the first part of this sentence and the last part of the sentence can both be incremental and/or transformational. Clearly define and introduce these terms. (UNITED STATES OF AMERICA)
188	14	3	50	0	0	The word "incumbent" is odd, though technically correct. Better to replace with "existing" which is more direct and clearly conveys the idea. (UNITED STATES OF AMERICA)
189	14	3	51	0	0	Transformative adaptation is raised as an issue first in the summary of the chapter and later in two sections of the chapter. In the chapter, it is stated that transformational adaptation seeks to change the fundamental attributes of systems and it includes changes in our perception and paradigms about the nature of climate change, adaptation and their relationship to other natural and human systems. This absolutely is needed for societies to respond to climate change challenges. Unfortunately, transformative adaptation actions are not treated in more depth in the chapter dealing with adaptation options. Creating systemic changes would be essential for adaptation to happen on the ground but the issue is not discussed in the chapter. (Kankaanpää, Susanna, Helsinki Region Environmental Services Authority (HSY))
190	14	3	54	0	0	Suggest that "transformational adaptation" is not only about changes in our perception and paradigms about the nature of climate change, but also about the extent of its social, economic and/or ecological implications. (UNITED STATES OF AMERICA)
191	14	3	54	3	54	This description seems to pertain to transformation more broadly, beyond transformational adaptation, which could be clarified. (Mach, Katharine, IPCC WGII TSU)

#	Ch	From Page	From Line	To Page	To Line	Comment
192	14	4	2	4	4	Would be useful to have an illustrative case study to support this sentence (which is discussing complex concepts). Generally the chapter is weak on illustrative case studies, which are very helpful to researcher and practitioner alike, and here is a place where one could be included. (Rissik, David, Griffith University)
193	14	4	2	4	4	This sentence raises the point that differentiating between incremental and transformational is essential, however this paragraph has not really made the case for why the differentiation is essential for how adaptation is approached. Further, the chapter doesn't really bring these two points back together again at the end. If this really is an essential point the reader would expect to see these points reinforced throughout the discussion. (UNITED STATES OF AMERICA)
194	14	4	3	4	4	The sentence that how we allocate adaptation funding in both developed and developing countries is not norm.I suggest to delete in both developed and developing countries, and not to emphasise country classification. (Duan, Juqi, National Climate Center, Chinese Meteorological Administration)
195	14	4	6	4	21	While mainstreaming, which is not a sub-chapter, is mentioned as an important aspect, mal-adaptation which is a sub-chapter is not introduced as part of this chapter. (Hanger, Susanne, International Institute for Applied Systems Analysis)
196	14	4	7	4	8	the concept of needs is not always clear in this chapter - sometimes it seems to the actual vulnerabilities to be responded to, and sometimes the enablers or removal of barriers to any responses or options that may be proposed. Overall it reads as mostly the second of these but would be good to be clearer - 'circumstances' could be both or either? Maybe positioning of needs in a diagram would help eg 'Impacts plus adaptive capacity -> vulnerabilities -> barriers/enablers (needs - if this is what is meant?) -> options' with a loop would help? (Webb, Bob, Australian National University)
197	14	4	7	4	9	"Requiring action" is a tight definition. Suggest reconsider this sentence. Sometimes the "action" can be to do nothing. We suggest broadening of definition of needs to include e.g., finance, knowledge, knowledge delivery etc. and to use this broader definition throughout the chapter. Adaptation is not just about safety. (Rissik, David, Griffith University)
198	14	4	8	4	9	This is a rather limited view of adaptation. It appears to be more of a DRR focus (and not a good one) rather than adaptation in the context of a changing climate. This is also limited considering the growing need to link adaptation to economic growth and development and to jobs (Street, Roger B, Oxford University)
199	14	4	9	0	0	recommend to change to " of available and appropriate strategies and measures to address needs" (VIETNAM)
200	14	4	12	4	3	Is this suggesting that there needs to be some maladaptation (i.e.if there is a balance between adaptation and potential maladaptation then this suggests that there is (or should be) some maladaptation)? (Street, Roger B, Oxford University)
201	14	4	13	0	0	recommend to change to "government actions" (VIETNAM)
202	14	4	13	4	14	Should this be (or was the intention to be) broader than just government? E.g. alternative text could be "decision making across society" (Rissik, David, Griffith University)
203	14	4	13	4	14	Is there any literature that raises the issues related to the limits to mainstreaming of adaptation (are there any or should there be such limits). This may be the case where mainstreaming alone may be insufficient to deal with the adaptation. (Street, Roger B, Oxford University)
204	14	4	14	4	0	I would consider assessments decision-making tools but not tools for implementation, at least not in a direct way. (Hanger, Susanne, International Institute for Applied Systems Analysis)

#	Ch	From Page	From Line	To Page	To Line	Comment
205	14	4	14	4	21	Reading this paragraph, it is already quite clear that there will be much overlaps between chapter 15 and chapter 16. "the existence of adaptation options does not necessarily mean that these options can be implemented when the need arises". Therefore, chapter 15 will examine the "challenges faced and how these can be addressed" regarding the transition from adaptation planning to implementation, whereas chapter 16 examines "adaptation opportunities and constraints". The challenge of moving from planning to implementation actually refers to some of the adaptation constraints (Moser, S. C. and J. A. Ekstrom. 2010. A framework to diagnose barriers to climate change adaptation. Proceedings of the National Academy of Sciences). So if the constraints that relates to the challenge of moving from planning towards implementation are addressed in chapter 16, I do not see much interest in chapter 15. Furthermore (read my comments below), I think that chapter 15 is actually failing to adress the issue of implementation, which is another drawback to its scientific interest. (Dupuis, Johann, Swiss Graduate School of Public Administration (IDHEAP))
206	14	4	20	4	21	This introduction of the focus of chapter 17 is overly narrow as economics more broadly is considered. (Mach, Katharine, IPCC WGII TSU)
207	14	4	24	0	0	The summary also could include something about iterative management. (Ebi, Kristie, ClimAdapt, LLC)
208	14	4	24	4	48	This summary of findings from the 4th assessment report needs to provide references to the relevant chapters (using the recommended citations for each chapter). (Mach, Katharine, IPCC WGII TSU)
209	14	4	24	4	50	Insights from AR4 are included but not clearly linked to the content of this chapter (Hanger, Susanne, International Institute for Applied Systems Analysis)
210	14	4	29	4	29	...insurance, but climate change, along with other drivers of change, poses novel risks often outside the range of experience. (Street, Roger B, Oxford University)
211	14	4	29	4	30	The last sentence needs further concretion. Which novel risks are faced? (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
212	14	4	29	4	30	Suggest providing examples of the novel risks posed by climate change to emphasize this point. (UNITED STATES OF AMERICA)
213	14	4	33	4	35	Replace "but" with "and". "But" implies that is a problem. It is not bad that these activities are not taken in response to climate change alone. (UNITED STATES OF AMERICA)
214	14	4	47	0	0	"relating to" typo (Rissik, David, Griffith University)
215	14	4	50	5	2	Need to define risk. Vulnerability is defined but not risk. (UNITED STATES OF AMERICA)
216	14	4	51	0	0	Looking back at the list of topics in the IPCC Plenary Approved Outline (http://www.ipcc-wg2.gov/AR5/ar5-outline.html#14) I think that the "Synthesis of adaptation needs" was not meant as an overview of institutional, social, biophysical/environmental and resource needs necessary so that adaptation can be implemented (like it is now done in this chapter 14.2) but was meant as a synthesis of the main climate change impacts and vulnerabilities that require adaptation. Actually, chapter 14.2 sounds more like a list of success factors or necessary requirements for the implementation of adaptation. This is interesting to read, but (a) seems to be redundant with what is described in chapter 15.3 as "Capabilities for Adaptation Planning and Implementation" and also with the "Adaptation Capacities" mentioned in chapter 16; and - even more important - (b) essential adaptation needs (e.g. need for better preparations for extreme weather events) do not get covered anywhere in the various adaptation chapters. (Grothmann, Torsten, Carl von Ossietzky University of Oldenburg)
217	14	4	51	0	0	In adaptation needs section (14.2), there is no sub-section on the need for effective communication between institutions, stakeholders etc. Text should be added and should make a bridge to Chapters 15 and 16. (Rissik, David, Griffith University)

#	Ch	From Page	From Line	To Page	To Line	Comment
218	14	4	51	4	51	Should there not be a sub-section (or more inclusion within one of the existing sub-sections) on built environment and infrastructure needs? This is a major societal and resource needs within both developed and developing countries. (Street, Roger B, Oxford University)
219	14	4	51	5	24	Adaptation needs; addresses the requirement for information about risks and vulnerabilities (physical and biological aspects), and recognizes the "political economy perspective" that considers social vulnerability; might draw out a little further on the political economy analogy to address political will, political credibility, acceptability, importance of political leadership. (UNITED STATES OF AMERICA)
220	14	4	53	0	0	Include opportunities (Rissik, David, Griffith University)
221	14	4	53	4	53	Why does the report point out the necessity to build capacities of nations, regions, cities, communities and individuals but takes out sectors (or policy fields) and private industries on this? Did I miss some kind of definition or assumption in this regard? I find it really important that both sectors and private industries are addressed because a lot of adaptation strategies define sectors as main fields of actions. Also, public administration is usually associated with a leading role for the coordination of adaptation activities. (Puetz, Marco, Swiss Federal Institute for Forest, Snow and Landscape Research WSL)
222	14	4	53	4	54	Where does adaptation to realise the benefits arising from climate change fit within this dialogue? It should be there. (Street, Roger B, Oxford University)
223	14	4	53	5	1	Minor comment: Missing from this sentence is some characterisation or 'anchor' that relates what we are reducing risk and vulnerability "to" in our efforts to adapt. Problem-oriented approaches describe these 'anchors' for why we seek to adapt as "valued outcomes", encompassing both climate and non-climate considerations. A suggestion in order to add an 'anchor' to this sentence: "Adaptation involves reducing risk and vulnerability to a valued outcome, ...". (Adler, Carolina , Swiss Federal Institute of Technology (ETH) Zurich)
224	14	4	53	5	6	In AR5 vulnerability and exposure are separately identified. Perhaps that can be mentioned here. (Chatterjee, Monalisa, IPCC WGII TSU)
225	14	4	54	0	0	Insert "and natural systems " after the word individuals (Rissik, David, Griffith University)
226	14	4	54	4	54	In addition to coping with climate impacts, there is a need to move beyond merely copying (Street, Roger B, Oxford University)
227	14	5	0	6	0	Section 14.2.1: Silent on sectoral coordination and mainstreaming of adaptation (INDIA)
228	14	5	1	0	0	Authors define vulnerability here but don't define risk. Suggest define "risk" (Rissik, David, Griffith University)
229	14	5	1	5	3	In SREX, vulnerability and exposure are considered separately, rather than exposure being considered as a component of vulnerability. Please clarify the discussion here to reflect this change. (Mastrandrea, Michael, IPCC WGII TSU)
230	14	5	1	5	6	Here it would be best to indicate explicitly that, in the special report on extremes and the current report, exposure is treated as separate from vulnerability, not simply as one component of it. (Mach, Katharine, IPCC WGII TSU)
231	14	5	3	5	6	This definition is not consistent with the glossary definition or with the SREX. (Ebi, Kristie, ClimAdapt, LLC)
232	14	5	5	5	6	These references need to be reviewed and updated, wealth of literature for authors to select from. (Rissik, David, Griffith University)
233	14	5	8	5	10	The report states the importance of risk assessments and points out that the identification of needs is often rooted in a formal risk or vulnerability assessment. Could you please give evidence for that statement, show examples and specify how much is "often". In Europe, at the national level, only the UK and Switzerland conducted risk assessments. I would argue, that at least in Europe most adaptation strategies and other activities are based on impact assessments. (Puetz, Marco, Swiss Federal Institute for Forest, Snow and Landscape Research WSL)

#	Ch	From Page	From Line	To Page	To Line	Comment
234	14	5	8	5	17	As a literature review for vulnerability and vulnerability frameworks, this is not enough. Just mentioning these two general approaches does not cover the ongoing discussion. If you do not want to spend too much time on this conceptual discussion, mention at least that there are more approaches and give 2-3 references, where these frameworks have been discussed (e.g. Preston et al. 2011 in <i>Sustainability Science</i> , vol. 6(2), pp. 177-202). (GERMANY)
235	14	5	8	5	17	"Preston et al (12) Putting vulnerability to climate change on the map: a review of approaches, benefits and risks. <i>Sustainability Science</i> , 6, 177-202" would make an excellent resource reference for this paragraph. (Hole, David, Conservation International)
236	14	5	8	5	17	Are these the only two frameworks - Risk-hazard and political economy? There are others that can be discussed. Do not characterize political economy as an alternative framework, as there are overlaps and complementary portions. More explanation and examples might be helpful. (UNITED STATES OF AMERICA)
237	14	5	9	0	0	Using the word "mitigate" in this context is confusing. Suggest use "reduce" in place (Rissik, David, Griffith University)
238	14	5	16	0	0	References are missing in reference list. Also these are very old references. Is there not more recent literature to refer to? (Rissik, David, Griffith University)
239	14	5	19	0	0	Add "ecosystem" at end of line AH (Rissik, David, Griffith University)
240	14	5	19	5	19	Vulnerability and risk assessments typically provide insights into the current and future vulnerabilities and risks in the context of climate and climate change (there are other assessments such as adaptation assessments and impact assessments that do not provide insights into vulnerabilities and risks (Street, Roger B, Oxford University)
241	14	5	20	0	0	Consider using Fünfgeld H. & D. McEvoy (2011) Framing Climate Change Adaptation in Policy and Practice, VCCCAR working paper 1, VCCCAR, Australia. ISBN 978 0 7340 http://www.vcccar.org.au/files/vcccar/Framing_project_workingpaper1_240511.pdf (Rissik, David, Griffith University)
242	14	5	23	5	24	Suggest including a reference that identifies the determinants of social and biophysical vulnerability (Street, Roger B, Oxford University)
243	14	5	26	5	26	Not sure that the use of the phrase adaptation needs is helpful. This table is identifying the scope of adaptation measures available. (Street, Roger B, Oxford University)
244	14	5	30	6	14	The state is not concise and like write textbook in this part, most of sections are used to explain concept. For example, it explain what is institutional needs, social needs, and so on, but it does not explain need what and whether satisfy in second section, P5L30~P7L54 ; It explain what is institutional options, social options, and so on. However, it does not explain global and region option what finally. The same question can be found in other section of this part. So, the main body can not support the bold print conclusion in ES, P2L31~P3L15, TS and SPM content. (Duan, Juqi, National Climate Center, Chinese Meteorological Administration)
245	14	5	30	6	14	This subsection needs describing the importance of integrating adaptation in the national or local social economic development plans. (Shaohong, Wu, Chinese Academy of Agricultural Sciences)
246	14	5	30	7	54	There are many citations to explain what are needs, but lack of evidences to show what activities have been done to meet the requirements of the "needs". I suggest supplement relate to content. (Duan, Juqi, National Climate Center, Chinese Meteorological Administration)
247	14	5	30	7	54	There are many citations to explain what are needs, but lack of evidences to show what activities have been done to meet the requirements of the "needs". (Shaohong, Wu, Chinese Academy of Agricultural Sciences)

#	Ch	From Page	From Line	To Page	To Line	Comment
248	14	5	31	5	35	I think that here the authors should "give back to Caesar what belongs to Caesar" as to avoid "reinventing the wheel". The definition of institutions do not belong to the adaptation community and seems to rely very much on the work of Douglas North "humanly devised constraints that structure political, economic and social interactions; (North, D. C. 1991. Institutions. Journal of Economic Perspective 5:97-112.) or alternatively on the work of Elinor Ostrom "institutions are enduring regularities of human action in situations structured by rules, norms, and shared strategies, as well as by the physical world" (Crawford, S. E. S. and E. Ostrom. 1995. A grammar of institutions. American Political Science Review:582-600.) (Dupuis, Johann, Swiss Graduate School of Public Administration (IDHEAP))
249	14	5	32	0	0	recommend to revise the first sentence of the graph (VIETNAM)
250	14	5	32	5	32	The chapter and the report does not adequately cover the informal aspects, rules etc. Perhaps the chapter could add a little more discussion on it. (Chatterjee, Monalisa, IPCC WGII TSU)
251	14	5	34	5	35	"distribution of climate risks" is an important and complex issues. Additional discussion should be included. (UNITED STATES OF AMERICA)
252	14	5	34	5	36	These can enable adaptation or act as barriers to adaptation (Street, Roger B, Oxford University)
253	14	5	36	5	38	Sentence "At the...countries" is condescending. Suggest revise. (Rissik, David, Griffith University)
254	14	5	36	5	38	Not only to developing countries but also developed countries. (Shaohong, Wu, Chinese Academy of Agricultural Sciences)
255	14	5	36	5	45	Contradictory concepts in these sentences. Page 2 line 48 highlight role of local institutions as key players. But, the scale of the solution has to be matched to the problem to be successful. Thus, in the Murray-Darling Basin, local solutions don't match the catchment scale and are unlikely to be effective in the long-term. See also chapter statement on p13 lines 3 and 4. (Rissik, David, Griffith University)
256	14	5	40	5	42	Add example from Murray Darling Basin – where localism doesn't work and you have to scale up. Could add text along lines of: "For example, the pivotal role played by the Australlian federal government, working in concert with the state and local governments, in the development of water allocation policies in the Murray Darling Basin, Australia". Consider additional references: McKay, J, 2005. Water institutional reforms in AustraliaWater Policy 7: 35–52 Hussey, K and Dovers, D, 2006, Trajectories in Australian Water Policy, Journal of Contemporary Water Research & Education, Volume 135, Issue 1, pages 36–50, December. (Rissik, David, Griffith University)
257	14	5	42	5	45	This example could be expanded to explain why the large, centralized government systems of planning, taxation, and revenue distribution in these cases have limited ability to adapt to climate change. Was it something specific (e.g., lack of flexibility in policy) or was it the fact that the systems are large and centralized? As it reads now, it could be interpreted that the IPCC suggests large, centralized governance systems are not suitable for adaptation to climate change. (CANADA)
258	14	5	43	5	45	Text cites study saying middle eastern governments are more vulnerable because they have centralized water management. Note that arid zone countries that rely heavily on irrigation generally must have highly centralized water management in order to operate the giant engineered systems necessary to support large scale irrigated agriculture and big cities. One could make the case that the benefits of centralized water management induced the invention of civilization and central Governments in the Indus, Tigris/Euphrates, Yangtse, and Nile Rivers. In wetter climes, many communities can obtain needs water locally using decentralized system. (UNITED STATES OF AMERICA)
259	14	5	44	0	45	recommend to revise the last sentence of the graph (VIETNAM)

#	Ch	From Page	From Line	To Page	To Line	Comment
260	14	5	44	5	45	Drawing on case studies of water systems in the Midele East and North Africa, Sowers et al. maintain that the largely centralized systems of planning, taxation, and revenue distribution render governments more vulnerable since they are limited in their ability to adapt to climate change. This seems to imply that centralized taxation is a major barrier to adaptation and that conclusion seems to broad for a synthesis document. In addition, centralized planning can be a barrier, but if adaptation is mainstreamed into centralized planning then that centralized planning solution becomes a driver of adaptation. A less generalized and more careful synthesis relating to national level and centralized government actions is needed. (UNITED STATES OF AMERICA)
261	14	5	47	5	47	Could 'local government' be defined? Does it refer to local municipal government, provincial/state government, both? (CANADA)
262	14	5	47	5	50	Be clearer about terms - some of these actions do not necessarily enhance adaptive capacity; they are reducing risk rather than enhancing adaptive capacity (Rissik, David, Griffith University)
263	14	5	47	5	54	Chapter 5 of the SREX assesses the role and importance of the local scale when adapting to extreme weather and climate events. (Ebi, Kristie, ClimAdapt, LLC)
264	14	5	47	5	54	Need to understand the scope of local government's instituional influence. Not all local governments are able to develop regulations and building codes (Street, Roger B, Oxford University)
265	14	5	47	6	3	It is good to mention that governments have the potential to influence adaptive capacity, however particularly local governments in developing countries (but also in other levels) very often lack the human and technological capacity to enforce regulations. (GERMANY)
266	14	5	47	6	3	Only talking about the advantages of localism without citing the problems of local approaches as per examples in the literature. It's important to consider the appropriate scale for implementing adaptation – local, state or federal. (Rissik, David, Griffith University)
267	14	5	47	6	3	Would be useful to add some specific examples here - such as the authors have done on Chapter 14, page 7, line 1 to 4 (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
268	14	5	47	6	3	I would note that for many local governments, including those in developed countries, limited access to resources is a major barrier to adaptation - balance resources available with the demand for essential /statutory services ofthen means that there are no resources for anything else, including adaptation (Street, Roger B, Oxford University)
269	14	5	48	0	0	What does 'those related zoning' mean? (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
270	14	5	48	0	0	This sentence not true everywhere. Consider modifying text to read "developing and implementing" See: Hussey, K, Price, R, Pittock, J, Livingstone, J, Dovers, D, Fisher, D and Hatfield-Dodds, S, 2013, Statutory Frameworks, Institutions and Policy Processes for Climate Adaptation, National Climate Change Adaptation Research Facility, Gold Coast. (see Hussey et al 2013_Ch14.docx) (Rissik, David, Griffith University)
271	14	5	52	0	53	The sentence needs to be revised (VIETNAM)
272	14	5	52	5	52	Suggest adding: In the US, State governments also set design standards for highway infrastructure (with Federal oversight). Setting and application of design standards can affect future vulnerability and resilience. (UNITED STATES OF AMERICA)
273	14	5	52	6	3	Are these statements from Corfee-Morlot et al. (2011) limited to local governments? It seems they could apply to all levels of government. Are there additional sources that could broaden the scope of these statements to beyond local government? Is there a specific reason the authors are choosing to highlight these particular governance issues at the local level? (CANADA)

#	Ch	From Page	From Line	To Page	To Line	Comment
274	14	5	54	0	0	"short term election cycles" should be replaced with "short term interests"... local governments may be influenced in their decisions regarding zoning and land use... this has little to do with elections... In addition this document should be cautioned to imply that dictatorships are solution to help adaptation. (UNITED STATES OF AMERICA)
275	14	6	3	0	0	Suggest including the text: "It is important to match the appropriate institutional scale with the scale of implementation." (Rissik, David, Griffith University)
276	14	6	5	6	6	is there also the flexibility across and within the institutions - willingness and capacity to evaluate and where and when necessary, reorganise to deliver. (Street, Roger B, Oxford University)
277	14	6	5	6	14	This is a useful discussion of institutional design issues, but change text from saying there are four (and only 4) design issues to a broader statement that reads: "There are critical institutional design issues that can be evaluated." For example, IPCC does not need to conclude that there are only 4 institutional design issues that matter, particularly given differences in local and national conditions. (UNITED STATES OF AMERICA)
278	14	6	5	6	14	Research and development, and knowledge and technology transfer also are important for promoting adaptive capacity. (Ebi, Kristie, ClimAdapt, LLC)
279	14	6	10	0	0	"The first is the extent to which institutions are flexible." Is the intent to articulate that systems which are flexible can handle uncertainty or something else? (UNITED STATES OF AMERICA)
280	14	6	17	0	0	Section 14.2.2: The authors should consider renaming Section 14.2.2 "Social Needs" as it does not accurately reflect the underlying text (i.e., "Different Capacities to Adapt"). The current text discusses largely health issues, indicating that the poor, elderly, sick, and disabled are most at risk, but that is the case in all societies for all factors and is not unique to climate. The more important aspect of "social needs" for adaptation are the types of social organization. How people interact with their environment to make a living is what largely determines social connections, behavioral processes, and economic status across a society. For example, small-holder farmers in a poor African nation with a post-colonial government live within a balance of factors that only provide so many options for adaptation before they are looking at social collapse, and understanding that nexus is the key. The section (and perhaps the whole chapter) should focus in on this perspective, which is a more operational understanding of climate adaptation options. The last two sentences in the section are the closest to this concept. These 2 sentences should be expanded upon for this section, and the issues related to women, the poor, etc. should be dealt with in sections on environmental justice as well as human health impacts. [The Social Options section (14.3.3) seems to take the approach of considering modes of production and organization]. This is also a large part of the discussions in chapter 16. (UNITED STATES OF AMERICA)
281	14	6	17	0	0	Institutions perhaps include social aspects in addition to governance. Not clear why this is a separate section. (Chatterjee, Monalisa, IPCC WGII TSU)
282	14	6	17	6	48	Might it be relevant to address mental health as it pertains risks in more affluent populations? There also may be aspects of the willingness to help based on crisis fatigue - may need to connect to the resource section (UNITED STATES OF AMERICA)
283	14	6	17	7	18	re the previous point on clearer definition of the use of the concept 'needs' these 2 sections seem to move between the actual vulnerabilities and the drivers/ barriers/ enablers. Also not clear if social needs is intended to cover all the 'needs' that flow from risks to human and built environment assets ie the entire complementary part to natural assets? (Webb, Bob, Australian National University)
284	14	6	19	0	48	comment on part 14.2.2: This part hasn't shown yet what are the real social needs (should have a list of the needs) and what should be provided to satisfy that, and the author should do more literature review and give more details about method to evaluate social needs (VIETNAM)

#	Ch	From Page	From Line	To Page	To Line	Comment
285	14	6	19	6	19	Is coping with the impacts of climate change sufficient? I would suggest that it is necessary, but that merely coping is not sufficient. Climate change impacts and vulnerabilities will require that we move beyond what is traditionally interpreted as coping. (Street, Roger B, Oxford University)
286	14	6	19	6	48	The social needs section (14.2.2) focuses mainly on the poor and should also consider that middle income populations can be adversely impacts by climate change as a stressor adding to other effects. For example economic losses due to climate disasters can cause decrease in economic status (e.g., from middle income to poor); these populations could potentially have less adaptive capacity than those "experienced" with poverty. Vulnerability assessments should also encompass transitioning between economic states due to climate impacts. (UNITED STATES OF AMERICA)
287	14	6	19	6	48	This should just be cross-referenced with the health section of this IPCC report. Refer to that chapter and make certain findings match. Consider adding a discussion of or reference to distribution of risk. In second paragraph, explain why women are at risk. Should young children be discussed? Include discussion of indigenous populations. At line 42, change "Social assessments are best conducted across" to "some social assessments can benefit by looking across". Cannot categorically conclude that all assessment are improved by doing them in the way suggested here. There are always local circumstances. (UNITED STATES OF AMERICA)
288	14	6	20	6	20	Would "key factors determining vulnerability" be more accurate? (Mach, Katharine, IPCC WGII TSU)
289	14	6	21	6	30	This material could consider and cross-reference the assessment of chapters 11 and 13. (Mach, Katharine, IPCC WGII TSU)
290	14	6	22	0	0	Suggest include the words "reliance on local ecosystem services". E.g reliance on local water etc Reference to consider: Allison, E. H., Perry, A. L., Badjeck, M.-C., Adger, W. N., Brown, K., Conway, D., Halls, A. S., Pilling, G. M., Reynolds, J. D., Andrew, N. L. & Dulvy, N. K. 2009 Vulnerability of national economies to the impacts of climate change on fisheries. Fish and Fisheries 10, 173-196, DOI: 10.1111/j.1467-2979.2008.00310.x. (Rissik, David, Griffith University)
291	14	6	22	0	0	And because poor people live in regions where agriculture will be more negatively impacted by climate change, earlier. This reference highlights the higher impact on developing countries because a) they are more dependent on climate sensitive activities such as agriculture but also because b) the impact of climate change is likely to be more damaging on agriculture and there are fewer or no benefits from the early stages of warming: Cline, W. R. (2007). Global Warming and Agriculture. Impact Estimates by Country Washington DC, Center for Global Development and Peterson Institute for International Economics. (Rissik, David, Griffith University)
292	14	6	25	0	0	The authors may want to state the role of insurance of lack there of as part of financial resources. (UNITED STATES OF AMERICA)
293	14	6	30	6	32	Add, "In addition, the climate change impact on income generation and employment, asset maintenance and access to services, and social security will greatly impact the most vulnerable further aggravating their situation" (M. Harsdorff, M. Lieuw-Kie Song; K. Philip; M. Tsukamoto. Towards an ILO approach to Climate Change Adaptation, ILO Employment Working Paper No. 104 - Geneva, International Labour Organization. 2011) (Harsdorff, Marek, ILO)

#	Ch	From Page	From Line	To Page	To Line	Comment
294	14	6	32	0	0	The literature on gender inequality is now substantial and we suggest additional references to support the statement that women will be disproportionately impacted by climate change. United Nations Development Programme (2009) Resource Guide on Gender and Climate Change. (see UNDP 2009_Ch14_P6_L32.pdf) Glazebrook, Trish. 2010. Gender and climate change: An environmental justice perspective. In Heidegger and climate change, ed. Ruth Irwin. London: Continuum. Cuomo, Chris 2011 Climate Change, Vulnerability, and Responsibility Hypatia vol. 26, no. 4 (Fall 2011) Alston, Margaret. 2008. The big dry: The link between rural masculinities and poor health outcomes for farming men. Journal of Sociology 44 (2): 133–47. Dankelman, Irene. 2010. Gender and climate change: An introduction. London: Earthscan. Hemmati, Minu, and Ulrike Röhr. 2007. A huge challenge and a narrow discourse: Ain't no space for gender in climate change policy? Women and Environment International 74–75: 5–9. Masika, Rachel. 2002. Gender, development and climate change. London: Oxfam. Terry, Geraldine (2009) Climate Change and Gender Justice. Oxfam GB, Oxford. CGIAR 2012 Gender and Climate Change Research in Agriculture and food security for rural development, CGIAR, FAO publication.(see CGIAR 2012_Ch14_P6_L32.pdf) WEDO (Women's Environment and Development Organization) (2008) Gender, Climate Change and Human Security – Lessons from Bangladesh, Ghana and Senegal. WEDO, New York. (see WeDo 2008_Ch14_P6_L32.pdf) United Nations Development Programme (UNDP) (July 2010) Gender, Climate Change and Community-Based Adaptation. New York, United States. (see UNDP 2010_Ch14_P6_L32.pdf) (Rissik, David, Griffith University)
295	14	6	32	6	32	Further work is required to clarify the statement that women are among the least able to cope with threats from climate impacts. It does not seem objective to claim this statement applies to all women. Further context could be provided to indicate that compounding influences of social circumstances, income levels etc may reduce adaptive capacity for some women. (AUSTRALIA)
296	14	6	32	6	32	Focus on women and elderly left out children as an entity (INDIA)
297	14	6	32	6	33	Pregnant women and children also are at particular risk. Note it would be appropriate to cite health literature on vulnerable groups. One example is Balbus, J.M.; Malina, C. Identifying vulnerable subpopulations for climate change health effects in the United States. J. Occup. Environ. Med. 2009, 51, 33-37. (Ebi, Kristie, ClimAdapt, LLC)

#	Ch	From Page	From Line	To Page	To Line	Comment
298	14	6	32	6	34	Adger and Smit not sufficient references. Lots of other more recent references. Some examples: Burton, Ian, Saleemul Huq, Bo Lim, and Emma Lisa Schipper. 2002. "From Impact Assessment to Adaptation Priorities: The Shaping of Adaptation Policy." Climate Policy 2: 145–49. Chukwumerije Okereke, Kate Dooley 2010 Principles of justice in proposals and policy approaches to avoided deforestation: Towards a post-Kyoto climate agreement Global Environmental Change, Volume 20, Issue 1, February 2010, Pages 82-95 Marc D. Davidson 2012 Distributive justice in the international regulation of global ecosystem services Global Environmental Change, Volume 22, Issue 4, October 2012, Pages 852-861 Göran Duus-Otterström, Sverker C. Jagers 2012 Identifying burdens of coping with climate change: A typology of the duties of climate justice Global Environmental Change, Volume 22, Issue 3, August 2012, Pages 746-753 Brooks, N, Adger, N and Kelly, M 2005 The determinants of vulnerability and adaptive capacity at the national level and the implications for adaptation Global Environmental Change, Volume 15, Issue 2, July 2005, Pages 151-163 Grasso, M 2007 A normative ethical framework in climate change, Climatic Change (2007) 81:223–246 M. Grasso, Justice in Funding Adaptation under the International Climate Change Regime, DOI 10.1007/978-90-481-3439-7_7, C _ Springer Science+Business Media B.V. 2010 Najam, A., Huq, S., & Sokona, Y. (2003). Climate negotiations beyond Kyoto: developing countries concerns and interests. Climate Policy, 3, 221–231. Page, E. A. (2008). Distributing the burden of climate change. Environmental Politics, 17(4), 556–575. Adger, W.N., 2001. Scales of governance and environmental justice for adaptation and mitigation of climate change. Journal of International Development 13 (7), 921–931. Haddad, B.M., 2005. Ranking the adaptive capacity of nations to climate change when socio-political goals are explicit. Global Environmental Change-Human and Policy Dimensions 15 (2), 165–176. Brown, H., Nkem, J., Sonwa, D., Bele, Y., 2010. Institutional adaptive capacity and climate change response in the Congo Basin forests of Cameroon. Mitigation and Adaptation Strategies for Global Change 15 (3), 263–282. Gupta, J., Termeer, C., Klostermann, J., Meijerink, S., van den Brink, M., Jong, P., Nooteboom, S., Bergsma, E., 2010. The adaptive capacity wheel: a method to assess the inherent characteristics of institutions to enable the adaptive capacity of society. Environmental Science & Policy 13 (6), 459–471. Pelling, M., High, C., 2005. Understanding adaptation: What can social capital offer assessments of adaptive capacity? Global Environmental Change-Human and Policy Dimensions 15 (4), 308–319. Young, O.R., 2010. Institutional dynamics: resilience, vulnerability and adaptation in environmental and resource regimes. Global Environmental Change 20 (3), 378–385. (Rissik, David, Griffith University)
299	14	6	32	6	38	This paragraph could consider and cross-reference relevant assessment in chapters 13, 9, 12, 20. (Mach, Katharine, IPCC WGII TSU)
300	14	6	32	6	38	Isolation from political and cultural mainstream can reduce adaptive capacity. It is worth noting that in some cases populations isolated from the mainstream, can have higher adaptive capacity than expected if there is high social cohesion amongst this population (Street, Roger B, Oxford University)
301	14	6	34	6	37	Written as if large-scale government adaptation decisions are only option. But sentence beginning on line 41 is on target and most practical. Sectoral initiatives are the scale at which action is most likely. (UNITED STATES OF AMERICA)
302	14	6	35	6	37	Access to safe water and improved sanitation also are very important factors. (Ebi, Kristie, ClimAdapt, LLC)
303	14	6	37	6	38	Delete the whole sentence: "In rural areas, adaptation needs..." If you decide to pick put the importance of Agricultural adaptation for rural adaptation (which is absolutely true - although mainly for developing countries), you should spend some more time on this issue than just one short sentence and one reference. Or you leave it out completely, if you just want to give an overview. But the current solution is not satisfying. Agricultural activities for rural adaptation are an important issue, but it does not really fit here and it is not explained sufficiently. (GERMANY)
304	14	6	40	0	0	Add temporal scales (Rissik, David, Griffith University)
305	14	6	44	6	44	Would not these assessments also contribute to identifying actions capable of reducing these vulnerabilities? (Street, Roger B, Oxford University)

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306	14	6	51	7	18	It talk about the convention on biological diversity at first in Biophysical and Environmental Needs section. According to title, it should contain more important content in main body, add to biological diversity adapt or synergies cope with climate change and biological diversity, environment policy and adapt climate change policy synergies, and strengthen ecosystem based approach. It can consider move the content page 9 line 5-29 to page 7 paragraph 19 and combination again synthetically. (Duan, Juqi, National Climate Center, Chinese Meteorological Administration)
307	14	6	53	0	0	Suggestion insert after systems, "and the condition of natural systems" delete biodiversity conservation and resources (Rissik, David, Griffith University)
308	14	6	53	6	53	It has explicit defined on biodiversity in Convention on Biological Diversity, which point out biodiversity conclude three levels that ecological system, species and gene. (reference: 《Convention on Biological Diversity》 article 2. Use of Terms) . revise : delete "ecological system" directly. (Duan, Juqi, National Climate Center, Chinese Meteorological Administration)
309	14	6	53	6	53	Delete the word "conservation". CC alters biodiversity, not biodiversity conservation. Biodiversity conservation is a direct human activity. (GERMANY)
310	14	6	53	6	54	Wrong expression. Climate change might affect biodiversity, but not alter biodiversity conservation (which is mostly a management concept and then linked to the response and not to the impacts). (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
311	14	6	53	7	18	This section could use additional material, especially given that the biophysical and environmental adaptation information needs are substantial; no references appear here to ocean and marine ecosystems; ocean environments,; warming oceans, rising sea levels (UNITED STATES OF AMERICA)
312	14	6	53	7	18	Good to draw out more clearly that ecosystems are important for adaptation because of two things; first, because they are sensitive to changes in climate. And second, because the ecosystem service can act as an adaptation in itself, so is of importance for adaptation even if it is not at risk from climate change. (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
313	14	7	0	0	0	It would be valuable to address vulnerability in populations that are "disconnected" by 2 or 3 steps from natural systems i.e. affluent populations dependent on technical systems and infrastructure for day to day comfort and functioning - if these are disrupted what are the implications? (UNITED STATES OF AMERICA)
314	14	7	1	7	3	This sentence is unclear and incomplete. Wildfire will affect half of the ecosystems? (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
315	14	7	1	7	18	These paragraphs could consider and cross-reference the assessment in chapters 4, 6, and 5, as well as the cross-chapter box on coral reefs. (Mach, Katharine, IPCC WGII TSU)
316	14	7	3	0	0	remove "that" in the sentence (VIETNAM)
317	14	7	3	7	4	Incomplete sentence. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
318	14	7	3	7	4	Sentence is not understandable, because it is incomplete. (GERMANY)
319	14	7	3	7	4	incomplete sentence (Rissik, David, Griffith University)

#	Ch	From Page	From Line	To Page	To Line	Comment
320	14	7	4	7	18	This section needs some work. For example, Lines 4-7 set up studies of ecosystems in contrast to studies of ecosystem services. This is not particularly productive, as all ecosystems provide services. An introductory sentence or two is needed to explain this - that ecosystem provide "services" (on benefits) to people, which can include everything from flood attenuation, to provision of habitat for commercially important species, etc. This could then transition into the next paragraph. Line 9 also needs editing, as it's not useful to say "natural systems are important not only for their own sake." This will already have been communicated if an explanation of ecosystem services is provided. Then the paragraph can delve into specific descriptions of how natural systems can serve a role in climate adaptation - and how adaptation of natural systems (through management actions) is needed to reduce impacts and vulnerability associated with climate change. Lines 13-15 make it sound like practices associated with ecosystem services conservation are not worthwhile from an adaptation perspective, which is not the case - needs to be clarified and/or paired with at least one example where these practices are effective (and there are many of these available). Also, could raise this as more of an information need - to improve understanding and valuation of ecosystem services provided by different adaptation options. Would also be worth mentioning maladaptation here, as many infrastructure adaptation practices can have negative effects on adjacent/local ecosystems and therefore reduce overall climate resiliency. (UNITED STATES OF AMERICA)
321	14	7	5	7	7	This refers to studies identifying climate change's "impacts on ecosystem services, particularly the effects of climate change on agricultural productivity" - an indication of the estimated effects (monetary, output, etc) would bolster this argument. (CANADA)
322	14	7	9	7	10	This statement is also valid in the absence of climate change, please consider removing "in the face of a changing climate". (NORWAY)
323	14	7	10	0	0	doesn't explicitly point to the fact that these systems are under stress. Suggest insert "healthy" (Rissik, David, Griffith University)
324	14	7	15	0	16	both references missing from ref list (Tallis Goldman) (Rissik, David, Griffith University)
325	14	7	15	0	18	Tallis is a weak example for a global chapter. "win - win" used here as multiple benefits rather than now and future benefits. Need to define (Rissik, David, Griffith University)
326	14	7	21	0	0	Section 14.2.4. Resource Needs: This section starts by stating 'successful implementation of adaptation depends on...human capacity, information, access to technology and funding...' but only discusses funding (financial resources). This is not balanced and further descriptions of the other factors would be useful. Furthermore, the financial resource paragraphs within this section contain strong policy prescriptive statements that suggest the need to transfer wealth from rich to poor and developed to developing nations through international governance. This is certainly one option for adaptation but suggesting it is as a need is quite a strong statement. (CANADA)
327	14	7	21	0	0	This section also should discuss the human resource needs for adaptation, including having sufficient national expertise in the possible risks climate change poses. (Ebi, Kristie, ClimAdapt, LLC)
328	14	7	21	0	0	Relevant chapters (20, 22, 15, 16) from the report should be cross referenced here. (Chatterjee, Monalisa, IPCC WGII TSU)
329	14	7	21	7	54	It is that should add to describe that development countries adapt climate change exist ability is not enough, fund urgend need and amount large etc in resource needs sector. There is ought to have an reflect on quantivety to express developed countries supply fund to development contries, to avoid developed countries escape from history liability。Reference the 17th chapter 8th page, adapt the content in UNFCCC. (Duan, Juqi, National Climate Center, Chinese Meteorological Administration)

#	Ch	From Page	From Line	To Page	To Line	Comment
330	14	7	21	7	54	Section 14.2.4 discusses "resources," but the only resource discussed is financial when other resources would also be important. There should be a paragraph on human capital, a paragraph on information, and a paragraph on access to technology. In many places, despite resource constraints, the focus is now on improving these other three resource areas. Please cover these in more detail, with examples on what some of the leading countries or regions are doing (UK, California, etc) Local decision-makers thus face a choice about resources: - They can accept greater risk of damage or failure for individual facilities; which, aggregated over time and space, implies increased capital losses combined with reduced capacity and reliability of the systems that keep civilization running. This is a real cost that is likely to rise in the future, even if no specific episode can ever be reliably attributed to climate change. - Or, they can repair facilities as they are damaged, and build them back bigger and stronger. This requires no information about future climate change, but here will likely be some expensive unanticipated losses. - Or, invest in vulnerability assessments that may likely suggest ways of reducing future losses by relatively small early investments or behavioral changes, if one can get predicts of future risks. The key point is that resources will be consumed in all three situations, and adaptation planning, whether called by that name or not, is likely to consume fewer resources than the other available alternatives. Failure to plan for climate change doesn't prevent climate change, it simply ensures that whatever actually does happen will be a surprise, which is probably more costly than planning. (UNITED STATES OF AMERICA)
331	14	7	21	7	54	Section 14.2.4 resource needs opens by flagging the need for human capacity, information, technology, and funding. It then goes on to deal with financial needs in some depth, information and technology needs with limited depth, and does not address human capacity at all. This may be covered elsewhere but given that it is noted in the opening it should be signposted. You may also wish to highlight some of the work done around human capacity requirements for effective adaptation. A number of articles on this topic appear in a recent special issue of Environmental Development (Vol. 5, Jan. 2013) for example. (Harvey, Blane, IDRC)
332	14	7	23	7	23	Value of social capital should have explicit reference in the text. This is the critical element of community based adaptation approaches (INDIA)
333	14	7	23	7	23	As this section talks about financial resources for adaptation it would be useful to at least mention the political commitment agreed in the UNFCCC context, to mobilise 100 billion USD per year from 2020 onwards by developed countries for action on climate change in developing countries. (1/CP.16 para 98) (Harmeling, Sven, Germanwatch)
334	14	7	23	7	23	Need to clarify what you mean by 'appropriate'. (Street, Roger B, Oxford University)
335	14	7	23	7	32	May also be worth mentioning in this paragraph that even in developed countries, providing information services does not mean that users/ decision makers will be able to make effective use of them and that the needs will often need to be tailored and/or translated to individual context - see for example Webb, R. and J Beh, 2013. Leading adaptation practices and support strategies for Australia: An international and Australian review of products and tools, National Climate Change Adaptation Research Facility, Gold Coast, pp.120. Accessible at http://www.nccarf.edu.au/publications/leading-adaptation-practices-and-support-strategies . (Webb, Bob, Australian National University)
336	14	7	25	7	26	supposed lack of information - not sure if this relates to the apparent 'quality' of the information - credibility, legitimacy and saliency of that information (Street, Roger B, Oxford University)
337	14	7	26	7	26	What are the Nairobi Work Program and COP12? Please explain briefly. (GERMANY)
338	14	7	26	7	28	This sentence states the the Nairobi Work Program has made repeated calls for... A work plan cannot make calls. This sentence should be restated that included in the NWP are calls for... (Rosales, Jon, St. Lawrence University)
339	14	7	34	0	35	Remove first 'for adaptation' , add refs to support this statement. Why only developing – true also for developed. (Rissik, David, Griffith University)

#	Ch	From Page	From Line	To Page	To Line	Comment
340	14	7	34	7	37	Is there also some information on the situation(s) in developed countries? In addition, two linked limiting factors is the lack of a business case for adaptation, and our limited understanding of the links between adaptation and economic growth and jobs. Is there some literature on this that could allow these issues to be included in the chapter (or at least in the WGII report)? (Street, Roger B, Oxford University)
341	14	7	35	0	0	"modest funding" is a very political statement. Some countries have had a lot of money. Needs to be supported by reference, or case study. Why just developing countries? True also for developed countries. (Rissik, David, Griffith University)
342	14	7	35	7	37	Are there any references for the statement that only modest funding for adaptation has been available in developing countries? Using the word 'modest' without references or comparison make this sentence potentially read like a value statement by the authors. (CANADA)
343	14	7	37	7	37	Check the grammar of the first part of this sentence. (Street, Roger B, Oxford University)
344	14	7	37	7	39	Poor sentence (Rissik, David, Griffith University)
345	14	7	38	0	0	Replace "lack of clarity about the distinction between" with "the complex relationship between....". And links better to point in line 53 (Rissik, David, Griffith University)
346	14	7	40	7	41	When talking about the the "need to develop financial instruments" for reasons of completeness the Green Climate Fund (GCF) could be referenced (Harmeling, Sven, Germanwatch)
347	14	7	42	7	44	Poor sentence, restructure for ease to read. This is one of the few places in the chapter which looks at the link between disaster managaement and adaptation, so need to be absoulutely clear. (Rissik, David, Griffith University)
348	14	7	42	7	45	ILO has been advocating the use of national schemes, notably public employment programmes which have a longer-term perspective and can be used not only for disaster recovery, but also for disaster preparedness as a mechanism for disaster risk managment. See, "Waiting for foreseeable climate change events to strike and then rushing off to support the recovery of the affected populations is not a wise choice. The aftermath of a disaster is the wrong time to create new institutions, establish new policies and legal frameworks, and recruit staff as all of this takes time. Lessons learned from recent recovery operations have resulted in recommendations that governments must consider, ahead of time, how best to organize government agencies, institutions, laws and finances, in order to address large-scale recovery and reconstruction needs with minimal delay and maximum effectiveness. All this should be part and parcel of existing labour-intensive public employment programme strategies, if they exist, allowing for a rapid scaling-up if and when needed." (M. Harsdorff, M. Lieuw-Kie Song; K. Philip; M. Tsukamoto. Towards an ILO approach to Climate Change Adaptation, ILO Employment Working Paper No. 104 - Geneva, International Labour Organization, 2011) (Harsdorff, Marek, ILO)
349	14	7	45	0	0	Suggest adding new sentence in Line 45: "Disaster preparedness is increasingly being seen as an inherent component of adaptation." (WOODS, Paul, World Vision)
350	14	7	47	7	47	Casual usage of "likely" should be avoided, as it is a reserved likelihood term. (Mach, Katharine, IPCC WGII TSU)
351	14	7	47	7	48	Whose transfers are these? Public, private, both? 'For climate change': to what kind of activities does that refer? Including both mitigation and adaptation? And what exactly is 'development expenditure? Do the authors mean ODA? Please indicate what the terms 'transfers' and 'expenditure' refer to (and on what basis: annual? where?) and make sure not to compare apples and oranges (e.g. payments required for adaptation with current public ODA) (Pauw, Willem Pieter, German Development Institute (DIE))
352	14	7	47	7	48	The authors should strongly consider clarifying the first sentence of this paragraph to read: "Finances in the future required to address climate change will likely approach levels on the order of current development funding". The phrase "financial transfers" has political implications that obfuscate the intent of the statement that future fuding needs will grow significantly. (UNITED STATES OF AMERICA)

#	Ch	From Page	From Line	To Page	To Line	Comment
353	14	7	48	0	49	What exactly is meant by "for climate change"? Would that include disasters? (UNITED STATES OF AMERICA)
354	14	7	48	7	49	The argument that a delivery channel so that adaptation funding reaches the poor because they are "often" the most vulnerable to impacts of climate has a nice sound but is actually a non-sequitur. The poor are likely most vulnerable to infectious diseases caused by sewage system failure, but the solution is to make sure the sewage system doesn't fail beforehand rather than provide after-the-fact medical treatment to the poor. More generally, funds should go where they provide the biggest benefit to public welfare. Instead of "reaches the poor" suggest "benefits the poor." (UNITED STATES OF AMERICA)
355	14	7	51	7	54	An example would clarify what this statement means. (UNITED STATES OF AMERICA)
356	14	8	0	10	0	this sub-chapter on structural options seems to be too broadly conceptualized, it is four times or more as big as the other sub-chapters and contains too broad a set of adaptation options that might easily be sub-categorized. The last paragraph on technology-transfers seems particularly out-of-place (cf. chapter 15) (Hanger, Susanne, International Institute for Applied Systems Analysis)
357	14	8	3	0	0	It would be nice to also shortly name general management/planning strategies as adaptation options here (particularly iterative risk management promoted in chapter 2), perhaps as part of institutional adaptation options. Please also include a link to chapter 15 here that describes various adaptation planning tools that can all be regarded as adaptation options. (Grothmann, Torsten, Carl von Ossietzky University of Oldenburg)
358	14	8	3	0	0	It will be very helpful if it is also explained how adaptation option intersect with vulnerability reduction and development options. (Chatterjee, Monalisa, IPCC WGII TSU)
359	14	8	3	10	47	Section 14.3: does not discuss any policy options at all (INDIA)
360	14	8	3	12	52	Section 14.3 described different options of adaptation as well as functions of the options. But it lacks one more important thing that is giving a whole picture of what options being applied and how they have been implemented (Duan, Juqi, National Climate Center, Chinese Meteorological Administration)
361	14	8	3	12	52	Section 14.3 described different options of adaptation as well as functions of the options. But it lacks one more important thing that is giving a whole picture of what options being applied and how they have been implemented. (Shaohong, Wu, Chinese Academy of Agricultural Sciences)
362	14	8	5	8	8	Section 14.3: Adaptation options can be categorised in different ways and based on different approaches. It could be useful to provide a short overview of the most common approaches (i.e. classification used in the EU's White Paper on adapting to climate change: grey infrastructure approaches, green infrastructure approaches and soft approaches; etc). (ITALY)
363	14	8	5	8	8	Adaptation to address vulnerabilities and risks, in most cases will require a number of measures from across these categories (Street, Roger B, Oxford University)

#	Ch	From Page	From Line	To Page	To Line	Comment
364	14	8	5	11	48	The concept of adaptation options as well as the classification proposed by table 14-2 are in my opinion problematic. First, most examples of options presented in table 14-2 correspond to outputs or mesures resulting from public adaptation policies. Sea wall, vaccination programs, hazard mappings and so on, cannot be implemented by private actors or by private initiatives but are the results of policy programs. Why is the essential distinction between public and private actions on adaptation abandoned by this table and this section of the chapter? This is in my view misleading. And I am wondering why the term adaptation options is used here when most of the options that are presented are actually public adaptation measures. Second, the division between concrete / institutional / social option is problematic as well and suffer from overlapping and indistinctness. On which criteria is this classification made? As I mentionned above, the establismement of a sea wall can be understood as the outputs of a government policy or program. Government programs can include substantive and concrete elements or procedural / institutional elements, or both (Howlett, M. 2000. Managing the hollow state: Procedural policy instruments and modern governance. Canadian Public Administration 43:412-431; Knoepfel, P., C. Larrue, F. Varone, and M. Hill. 2011. Public policy analysis.) The Policy Press, Bristol.) How come is government policies classified as institutional when some policies are rather substantive and concrete and define actions to be taken? By contrast "municipal services" which is defined as a "service" can be understood as an institution according to the definition of institution that is used in this chapter. "Evacuation planning" falls in the category of outputs that results from disaster risk policies even though it is classified as "social options". Moreover "social options" do not mean much in my opinion, as again, all the examples that fall in this category correspond to outputs of public programs and overlap with concrete options. So the installation of an early warning system is not a concrete option? The classification into concrete/institutional/social do not hold. Furthermore, I think that the categories used are as well problematic. Why is it that every economic options are classified into "Institutional"? Direct payment for farmers would arguably be both economic and social or concrete. The same critic hold for the other categories. I think this table suffers from conceptual indistinctness and the criteria that are used to distinguish between concrete / institutional and social options and the various categories are not robust, overlap and should be presented carefully and transparently. I would suggest the reading of (Bemelmans-Videc, M. L., R. C. Rist, and E. Vedung, editors. 1998. Carrots, sticks and sermons: policy instruments and their evaluation. Transaction Publishers, New Brunswick (U.S.A) and London (U.K.). which is a very good example of how a classification of policy options can be based on robust criteria. (Dupuis, Johann, Swiss Graduate School of Public Administration (IDHEAP))
365	14	8	7	0	0	Suggest get rid of "concrete" - confusing. Perhaps replace with "physical" (Rissik, David, Griffith University)
366	14	8	7	8	8	Choice of categories is not widely accepted. Consider other categorisations of adaptation: Willows, Robert; Reynard, Nick; Meadowcroft, Ian; Connell, Richenda. (2003) ; Climate adaptation: Risk, uncertainty and decision-making. Part 2. Oxford, UK, Climate Impacts Programme, 41-87 (see Willows et al 2003_Ch16_P8_L7.pdf).; Scientific Expert Group on Climate Change (2007) Confronting Climate Change: avoiding the unmanageable and managing the unavoidable. In: Bierbaum RM, Holdren JP, MacCracken MC, Moss RH, Raven PH (eds) Report prepared for the United Nations Commission on sustainable development. Sigma Xi, Research Triangle Park, NC, and the United Nations Foundation, Washington, 144 pp (see Scientific Expert Group on Climate CHange 2007_Ch14_P8_L8.pdf); Hallegatte S. (2009) Strategies to adapt to an uncertain climate Global Environmental Change, 19, 2, 240-247.; McEvoy D., P. Matczak, I. Banaszak & A. Chorynski (2010) Framing adaptation to climate-related extreme events Mitig Adapt Strateg Glob Change 15:779–795, DOI 10.1007/s11027-010-9233-2 (Rissik, David, Griffith University)

#	Ch	From Page	From Line	To Page	To Line	Comment
367	14	8	10	8	11	Table 14.2: rethink the table. Not well categorised, neglects ecosystems. Could consider adding Culture as a category. Indigenous adaptation e.g. application of TK, ecological management, etc. Missing flood levees (the most commonly used engineering structure). These are all vulnerability indicators. Simplistic, insufficiently analytical. If retain: Line of social - Consider social adaptation needs of which reducing vulnerability would be one. Others might be include communication, education, awareness, building adaptive capacity. Suggest include an extra category: "communication". Rethink the table. More confusing than helpfu, not analytically. Lists constraints and problems rather than needs (Rissik, David, Griffith University)
368	14	8	12	8	13	There are plenty of examples from South Asian region. This is a well researched area in the SA region – should find a place in this section. In ICT applications mobile phone technology is paying rich dividends in terms of promoting resilience. E.g Farmer call centers in India (INDIA)
369	14	8	14	8	20	The use of the term "concrete" to reflect a single organization's terminology seems to be a poor choice in this international document, and one that will further confuse the issue of whether engineered ecosystems or beaches (with no concrete) are included. The rest of the text actually discussed "engineered" options as opposed to concrete. Prefer to use the term "Structural/Engineered" options here and in Table 14.2. Delete the last sentence in the paragraph (lines 20-21). This section will then agree with the executive summary. (UNITED STATES OF AMERICA)
370	14	8	14	10	15	The paragraphs on Ecosystem-Based Adaptation (EBA) are located under the heading "14.3.1. Structural / Concrete Options", which is surprising at a first glance. Even though the notion of "concrete" is well defined, I think the readers may find useful to have subheadings (14.3.1.1 Engineered options, 14.3.1.2. Technology and information options, 14.3.1.3. Ecosystem-based options, 14.3.1.4. Service-based options). (Locatelli, Bruno, CIRAD-CIFOR)
371	14	8	14	10	15	Section 14.3.1: Consider breaking "structural/concrete" down into more subcategories and discussing each one. This section is rich with information. A more refined categorization will help the reader. For example, there is the built environment, engineering, communications, ecosystem based adaptation, service activities, public health activities, infrastructure. How should the chapter really categorize this? The categories will overlap with each other and with the "institutional" and "social" options as well. (UNITED STATES OF AMERICA)
372	14	8	16	0	0	should change to "highlights" (instead of highlight) (VIETNAM)
373	14	8	16	8	16	It would be helpful to define outcomes and outputs as these have specific meanings. (Ebi, Kristie, ClimAdapt, LLC)
374	14	8	16	8	39	Section 14.3.1: This section would be better titled "Built Environment" . In addition, multidisciplinary design teams are a better reference than "engineering". Architecture, planning and land use attournies have critical roles to design for the climate of the future. Engineering often gets the attention as large capital program funding is directed toward large "protection" measures but these do not always make for a robust or resilient project. An example would help this section that demonstrated resilient systems design particularly addressing site hydrology (extremes of precipitation) and building enclosures (addressing extreme temperatures). Urban heat islands may frustrate efforts for climate change mitigation (GHG emissions) in districts with large historic buildings that hold heat. Addressing the role of codes for construction (building, electrical, plumbing etc) and the timing gap to incorporate criteria to address climate protection levels would be worthy to note. (UNITED STATES OF AMERICA)
375	14	8	22	0	0	There is a great example of Qinghai-Tibetan railway construction. Suggest to add a paragraph here. Please refer to the literater of "Qingbai Wu;Guodong Cheng;Wei Ma;Yongzhi Liu.Railway Construction Techniques Adapting to Climate Warming in Permafrost Regions[J] , 2008,V4(000): 60-66". (Shaohong, Wu, Chinese Academy of Agricultural Sciences)
376	14	8	22	8	25	There is a great example of Qinghai-Tibetan railway construction. Suggest to add a paragraph here. Please refer to the literater of "Qingbai Wu;Guodong Cheng;Wei Ma;Yongzhi Liu.Railway Construction Techniques Adapting to Climate Warming in Permafrost Regions[J], 2008,V4(000): 60-66". (Duan, Juqi, National Climate Center, Chinese Meteorological Administration)

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377	14	8	25	8	27	This list describes, generally, engineered coastal or flood protection strategies, which are rather far from a complete or meaningful list of how engineered system make be used in climate adaptation. Modern urban civilization depends on the operation of a network of complex and expensive engineered systems that provide fresh water, sewage treatment, electricity, heating, telecommunications, and transportation. Failure of these systems can endanger human health, and welfare. All of these systems are at vulnerable to climate change, and their failure would be costly in human life and welfare. There are many engineering-oriented approaches to hardening, redundancy, and relocation of critical infrastructure that may be less frequently cited but more relevant and useful than beach nourishment. (UNITED STATES OF AMERICA)
378	14	8	25	8	32	Engineering should also be about using "employment intensive local resource-based approaches" and "appropriate technologies" where approaches "comprise work methods and technologies where the use of local resources is favoured and optimized in the delivery and maintenance of infrastructure assets. Local capacities and local materials are used to the greatest possible extent, but without adversely affecting the costs and quality of the specified works." (Local Resource-based Approaches for Infrastructure Investments Source Book - ILO Sub regional office for Southern Africa, Harare, Zimbabwe, 2010) (Harsdorff, Marek, ILO)
379	14	8	26	8	27	After beach nourishment, include flood levees (most common example) (Rissik, David, Griffith University)
380	14	8	29	8	29	Relates to understanding the risks associated with the different options being considered (part of the assessment of adaptation options) (Street, Roger B, Oxford University)
381	14	8	29	8	31	It's not only structural/concrete options that must deal with uncertainties around projections. (UNITED STATES OF AMERICA)
382	14	8	29	8	31	Thinking of climate change as sea level rise, and adaptation as protecting against sea level rise, is a rather narrow view of climate change impacts and adaptation. It may be true that engineered solutions are subject to these limitations, but needing to decide what to do about climate change without knowing what changes will occur seems to be general limitation of almost any form of rational planning. Suggest this section be expanded to consider more forms of climate impacts and how they might be addressed. (UNITED STATES OF AMERICA)
383	14	8	31	8	32	This calls for a monitoring and evaluation capacity. I would suggest that this capacity should be recognised within this text. (Street, Roger B, Oxford University)
384	14	8	33	0	39	Counter example is the actions in the Netherlands following the 1953 floods. Should consider this additional response to same event but different country and with a more positive outcome. (Rissik, David, Griffith University)
385	14	8	39	0	0	Add reference to the planning for the new Thames barrier. See page 88 in: Lowe, J. A., Howard, T. P., Pardaens, A., Tinker, J., Holt, J., Wakelin, S., Milne, G., Leake, J., Wolf, J., Horsburgh, K., Reeder, T., Jenkins, G., Ridley, J., Dye, S., Bradley, S. (2009) UK Climate Projections Science Report: Marine and Coastal Projections. Met Office Hadley Centre, Exeter ftp://dossier.ogp.noaa.gov/NCASLR/Publications/UKP09_Marine_report.pdf (see Lowe et al. 2009_Ch14_P8_L39.pdf) (Rissik, David, Griffith University)
386	14	8	41	10	5	Whole section feels very disjointed with no transition between paragraphs, no argument to follow. Might be worthwhile categorizing these types of investments from the beginning and then discussing them in terms of comparative factors, rather than describing each one in one paragraph with no connection between the different paragraphs. (UNITED STATES OF AMERICA)
387	14	8	44	8	47	Suggest referring to additional agricultural adaptation practices such as integrated watershed approaches, drought monitoring and forecasting, etc. (CANADA)

#	Ch	From Page	From Line	To Page	To Line	Comment
388	14	8	47	0	0	14.2.2.1 could benefit from an additional reference to Moser's analysis of linkages between mitigation and adaptation: Moser, S. (2012). Adaptation, mitigation, and their disharmonious discontents. Climatic Change. 111 (2): 165-175. One point made therein is that synergistic policies, although potentially important, should not necessarily be prioritised. There is a risk in the desire to harmonize climate policies to disfavour stand-alone policies. This point is not made in this section as it stands. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
389	14	8	47	0	0	"....2008)." will be "....2008; Irfanullah et al., 2011)." (Irfanullah, Haseeb, Practical Action)
390	14	9	1	9	3	Another interesting application of ICT for adaptation is eHealth. See Holmner A, et al. Climate change and eHealth: a promising strategy for health sector mitigation and adaptation. Glob Health Action 2012 5: 18428 - http://dx.doi.org/10.3402/gha.v5i0.18428 (Ebi, Kristie, ClimAdapt, LLC)
391	14	9	5	9	7	How does the information on p.9, lines 5-7 relate to the information on p.7, lines 14-15? The perspectives on ecosystem services seem to differ. This speaks to the broader problem of a lack of discussion about ecosystems. (UNITED STATES OF AMERICA)
392	14	9	5	9	17	In this paragraph about EBA, an example could be added to show that EBA is gaining attention. More than 20% of the NAPA projects include ecosystem activities that contribute to social well-being or social adaptation, often in support of other adaptation measures (e.g. infrastructure)(Pramova et al., 2012) [Pramova E., Locatelli B., Brockhaus M., Fohlmeister S., 2012. Ecosystem services in the National Adaptation Programmes of Action. Climate Policy 12(4): 393-409. doi: 10.1080/14693062.2011.647848] (Locatelli, Bruno, CIRAD-CIFOR)
393	14	9	5	9	17	You may want to consider using examples from Haiti on water and soil conservation (adaptation measures linking employment-income security-pre and post disaster preparedness-community participation-institutional building) - http://www.ilo.org/global/about-the-ilo/newsroom/features/WCMS_113173/lang--en/index.htm and South Africa's Expanded Public Works Programme (removing alien vegetation to increase water levels linking these measures to employment-income security-community participation-biodiversity) - http://www.ilo.org/global/about-the-ilo/newsroom/features/WCMS_193578/lang--en/index.htm (Harsdorff, Marek, ILO)
394	14	9	5	9	17	Ecosystem based approach of adaptation (and mitigation) is a very important aspect for successful avoidance of degradation of natural systems and their important services by adaptation and mitigation actions, and crucial for successful handling of the si (NORWAY)
395	14	9	7	0	0	Suggest adding example from The Netherlands and China - reference: Wenger, C, Hussey, K, Pittock J, 2013, Living with floods: key lessons from Australia and abroad, National Climate Change Adaptation Research Facility, Gold Coast. (see Wenger et al 2013 Ch14 P9 L7.pdf) (Rissik, David, Griffith University)
396	14	9	14	0	0	May not be clear meaning of mitigation in this context; suggest use carbon sequestration. (Rissik, David, Griffith University)
397	14	9	14	0	0	Fish nurseries not hatcheries (Rissik, David, Griffith University)
398	14	9	15	9	17	Another activity is integrated vector management to control malaria and other infectious diseases. (Ebi, Kristie, ClimAdapt, LLC)
399	14	9	19	0	0	This opening sentence is too sweeping, generic and belittling – it depends on context, and there are many pros and cons. Consider revising (Rissik, David, Griffith University)
400	14	9	19	9	20	There are trade-offs related to land-use and the availability of 'space' for people and social, economic and environmental activities (Street, Roger B, Oxford University)

#	Ch	From Page	From Line	To Page	To Line	Comment
401	14	9	19	9	29	While there are challenges, it's important to note that effective/sustainable natural resource management (to enhance the resiliency of natural systems to climate change) can be an effective adaptation strategy. Also worth mentioning that one of the major barriers to EBA is also the lack of comparable methodologies applied to engineering approaches; more dialogue is needed between the engineering and ecological communities to collaborate on this information need. (UNITED STATES OF AMERICA)
402	14	9	19	9	29	Another application of ecosystems based adaptation that was not mentioned in this paragraph centres on providing diversification of livelihood options to alleviate poverty and promote subsistence beyond foreign aid (e.g. Adler, et al., 2012). 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 (Adler, Carolina , Swiss Federal Institute of Technology (ETH) Zurich)
403	14	9	26	0	0	Insert text "are often more expensive" after communities. See Wenger, C, Hussey, K, Pittcock J, 2013, Living with floods: key lessons from Australia and abroad, National Climate Change Adaptation Research Facility, Gold Coast. (Rissik, David, Griffith University)
404	14	9	27	0	29	Text makes it sound like Carpenter, 2009 provides evidence that there is little experience with ecosystem-based adaptation. But Carpenter, 2009 do not discuss ecosystem-based adaptation. (Alcamo, Joseph, UNEP)
405	14	9	27	9	29	This sentence is a bit biased. Adaptation, in general, has insufficient case studies to develop statistics on effectiveness, so a general statement would fit better than one on ecosystem-based adaptation. Furthermore, there are many experiences of the benefits of ecosystems and their services as providers of resilience, multiple benefits including mitigation and adaptation, etc. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
406	14	9	31	0	0	The authors should consider removing the word "concrete" and replace here with " specific and measurable." (UNITED STATES OF AMERICA)
407	14	9	31	9	38	Clarifying time scale would help in this section. Incremental long term effects regarding skill sets, mindsets/paradigms and value sets would be relevant for issues around raising resilient children or a resilient society. (UNITED STATES OF AMERICA)
408	14	9	31	9	39	Not clear as to where social justice concerns will be addressed within this text. There has been some discussion on these, including within the Joseph Roundtree Foundation publications (Street, Roger B, Oxford University)
409	14	9	32	9	32	Long-term and child malnutrition is unclear; by definition, malnutrition is long-term. (Ebi, Kristie, ClimAdapt, LLC)
410	14	9	48	0	0	Spelling error "Supple" replace with supply (WOODS, Paul, World Vision)
411	14	9	51	10	4	This material could cross-reference relevant assessment in chapter 8. (Mach, Katharine, IPCC WGII TSU)
412	14	9	53	10	2	The best energy efficient house may give poor performance in heatwave. See Wasim Saman report due to be published this month and available from www.nccarf.edu.au. Saman W., et al., 2013: A framework for adaptation of Australian households to heat waves. Suggest splitting sentence at "residences" p10, line 1 to include reference (see Saman et al. 2013_Ch14_P9_L53.doc) (Rissik, David, Griffith University)
413	14	10	2	10	4	A debate whether relocation is better or worse than in situ upgrading makes no sense except in the context of some specific location and population. How big is the risk? How much upgrading is feasible? How extensive is the relocation? Can acceptable land for relocation be obtained? At what cost? None of these questions have general answers. The text implies that there might be a general answer, but that people disagree about what the answer is. As in previous sections, discussion is sea-level rise centric. (UNITED STATES OF AMERICA)
414	14	10	2	10	4	This argument also needs to consider the sustainability in the context of climate change and other drivers of change (Street, Roger B, Oxford University)

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415	14	10	6	0	15	that part should mention about how to overcome the high cost of renewable technologies (many ppl want to apply the renewable and low carbon technologies but because the hight cost of those technologies, they are not able to do so) (VIETNAM)
416	14	10	6	10	15	The point being made--that tech transfer for adaptation may be easier than for GHG mitigation--could be made more explicit. (UNITED STATES OF AMERICA)
417	14	10	6	10	15	Informal settlements also are important to consider. (Ebi, Kristie, ClimAdapt, LLC)
418	14	10	10	0	0	"....a region of interest." will be "....a region of interest (Irfanullah et al., 2008)." (Irfanullah, Haseeb, Practical Action)
419	14	10	10	10	15	Local resource-based approaches and appropriate local technologies for developing and reinforcing local infrastructure surely needs to be taken into consideration when mentioning "technologies that may become more important in adapting to climate change" for various reasons. "This approach emphasizes local participation during the identifying, planning and use of local resources, including labour, materials and enterprises for implementing and maintaining local infrastructure. The combined use of local participation in planning with the use of locally available skills, technology, materials and appropriate work methods has proven to be a technically efficient and economically viable approach to local infrastructure works in developing countries. Today, this approach to infrastructure planning and development is being mainstreamed in a number of countries as part of government strategies for effectively providing social and economic services and creating employment." (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) (Harsdorff, Marek, ILO)
420	14	10	13	0	0	Building codes are including in institutional (14.3.2) as well structural (14.3.1) category. This emphasises the problem with the chosen categories. (Rissik, David, Griffith University)
421	14	10	13	10	15	Affordable housing is also an issue in developing countries; replace institutional with "institutional and impementation" and add "as well as housing affordability" (Rissik, David, Griffith University)
422	14	10	13	10	15	This sentence refers to 'Revised building codes' as increasing resilience, but provides no example to support this claim. The argument would benefit from a strong example. (CANADA)
423	14	10	18	0	0	Political dynamics, political will should perhaps also be discussed here. (Chatterjee, Monalisa, IPCC WGII TSU)
424	14	10	18	10	47	Completely missing ecosystems in this section. (Rissik, David, Griffith University)
425	14	10	18	10	47	the institutional options offered here considerably overlap with sections in chapter 5 (which have as such been speficed in the approved outline) (Hanger, Susanne, International Institute for Applied Systems Analysis)
426	14	10	20	10	29	Funding for post-disaster recovery is not necessarily a good thing, because it can and frequently does encourage building in wrong place. Need to include critical analysis of disaster funding leading to rebuilding in hazardous areas. Need to be clear about the need for a policy of betterment, and the financial challenges of going down this path. (Rissik, David, Griffith University)
427	14	10	20	10	30	It would be useful to mention in this section the opportunity management such as growing foods in new locations and lower heating needs. the rezoning statement could use emphasis on the role of designating land use to support resiliency overtime. this section does not mention private sector roles. (UNITED STATES OF AMERICA)
428	14	10	26	10	27	Building codes: True but only happens with time, and timescales can be long. (Rissik, David, Griffith University)
429	14	10	26	10	27	This sentence refers to 'building codes' again, but does not provide the context necessary to show the reader why this point is important. Suggest revising. (CANADA)
430	14	10	27	10	27	What does 'zoning' mean? (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)

#	Ch	From Page	From Line	To Page	To Line	Comment
431	14	10	28	0	0	Missing references. Consider Burby RJ 2006, Hurricane Katrina and the Paradoxes of Government Disaster Policy: Bringing About Wise Governmental Decisions for Hazardous Areas, Annals of the American Academy of Political and Social Science March 2006 vol. 604 no. 1 171- 191. Burby, R J 1998, Cooperating with nature – confronting natural hazards with Land-Use Planning, Joseph Henry Press, Washington D.C. (Rissik, David, Griffith University)
432	14	10	32	10	39	Seems to leave out any discussion of national/local level. (UNITED STATES OF AMERICA)
433	14	10	32	10	39	May also be worth flagging the degree to which institution strengthening is being signaled as a priority need for adaptation in developing countries (see Kumamoto & Mills 2012, What African countries perceive to be adaptation priorities: results from 20 countries in the Africa adaptation programme, Climate Policy Vol.4 (4): 265-274.) (Harvey, Blane, IDRC)
434	14	10	32	10	39	Is there any evidence of work on the flow of financial resources nationally and locally? Investments capabilities within country and within local government? (Street, Roger B, Oxford University)
435	14	10	41	10	44	Democratic processes are necessary because they safeguard healthy (non-violent) human relations, but they are no guarantee for the right decisions. Only when a disaster happens, all minds are aligned that a change is necessary, and within 5 years this alignment is eroded again. (NETHERLANDS)
436	14	10	43	10	44	Superfluous text, no support to statement (Rissik, David, Griffith University)
437	14	10	45	0	0	Example in Australia - water trading minimises the impact of drought on the economy. See Mallawaarachchi, T. and Foster, A. (2009). Dealing with irrigation drought. The role of water trading in adapting to water shortages in 2007–08 in the southern Murray-Darling Basin. ABARE Research Report to the Department of the Environment, Water, Heritage and the Arts, Canberra, March.09.6 March 2009. http://adl.brs.gov.au/data/ (see Mallawaarachchi&Foster 2009_Ch14_P10_L45.pdf) (Rissik, David, Griffith University)
438	14	10	45	10	45	Please say how governance mechanisms enhance adaptive capacity, not just that it did. That is the key piece of information. (UNITED STATES OF AMERICA)
439	14	10	46	10	47	Superfluous text, no support to statement (Rissik, David, Griffith University)
440	14	10	47	10	47	To add an sentence that institutional capacity building is crucial in the good climate governance of the developing countries in this paragraph. (Duan, Juqi, National Climate Center, Chinese Meteorological Administration)
441	14	10	50	0	0	Section 14.3.3. on "Social Options" could also link to some extent to what is mentioned in Chapter 2 under section 2.2.3.1. "Value Setting". Societal options for adaptation are largely influenced by individual and collective values and desired outcomes in a given context, as eluded to in this sub-section of Chapter 2. I do not necessarily see an overlap, however a cross-reference here to this broader discussion on values in Chapter 2 would be useful for readers to link adaptation options with values. (Adler, Carolina , Swiss Federal Institute of Technology (ETH) Zurich)
442	14	10	50	0	0	Section 14.3.3 could be reviewed. At the moment "social options" seems to cover learning, knowledge sharing, education, and deployment of ICTs whereas the earlier section on "social needs" (14.2.2) seemed to point more to questions of access and inclusion taking an approach more closely aligned with a focus on livelihoods. This would then have suggested Adaptive Social Protection and other similar social options should be found here (see Davies et al 2008, 'Adaptive Social Protection': Synergies for Poverty Reduction. IDS Bulletin 39 (4): 105-112). While the issues raised in the current text are relevant, they create a disjuncture. (Harvey, Blane, IDRC)
443	14	10	50	0	0	social options section seems to be a collection of different adaptation strategies ranging from education, information, warning, etc Labeling it as "social" may not be suitable. (Cheong, So-Min, University of Kansas)
444	14	10	50	0	0	Authors may wish to consider how to connect with chapters 13, 8, 9, 10 and 11. (Chatterjee, Monalisa, IPCC WGII TSU)
445	14	10	50	0	0	Authors may wish to mention working with vulnerability reduction and social inequities in this section. (Chatterjee, Monalisa, IPCC WGII TSU)

#	Ch	From Page	From Line	To Page	To Line	Comment
446	14	10	50	11	19	Very simplistic treatment of social options. Focus on education and extension very limited. Lots of additional literature that could have been drawn on e.g: Yohe, G., Tol, R.S.J., 2002. Indicators for social and economic coping capacity - moving toward a working definition of adaptive capacity. In Global Environmental Change-Human and Policy Dimensions 12 (1), 25–40. Also: Davidson, J., Leith, P., Nursey-Bray, M., van Putten, I., Madin E and Holbrook, N.: A working indicator framework to operationalise resilience thinking in Australian marine sectors dealing with climate change in Ecology and Society Hinkel, J 2011 "Indicators of vulnerability and adaptive capacity": Towards a clarification of the science–policy interface Global Environmental Change 21 198–208 (Rissik, David, Griffith University)
447	14	10	52	11	19	the social options offered here considerable overlap with sections in chapter 5 (which have as such been specified in the approved outline) (Hanger, Susanne, International Institute for Applied Systems Analysis)
448	14	10	53	10	53	The term many also needs a qualifier. Many scholars/authors/... this is an issue throughout the report. Perhaps it is a stylistic preference and minor detail that could be overlooked. (Rosales, Jon, St. Lawrence University)
449	14	11	0	12	0	I think this is an important chapter but unfortunately does not address the fact that the selection of adaptation options is extremely challenging as it is strongly affected by political and budget allocation issues. As the report shows correctly a lot of adaptation activities are not only motivated by climate concerns but also for development or other reasons. As a result, at least in Europe, a lot of sectors (e.g. agriculture, tourism, energy, biodiversity) try to sell their sectoral issues and activities as adaptation issues and activities to influence the political agenda and to get more/additional funding. (Puetz, Marco, Swiss Federal Institute for Forest, Snow and Landscape Research WSL)
450	14	11	3	11	3	Under 14.3.3. "Social Options" you mentioned the specific vulnerability of certain groups. It would make sense to mention supporting general development (reducing vulnerability, education, access to assets etc.) as an important social option for adaptation. Add: "In addition to measures specifically tailored to managing climate risks through supporting adaptation, "classic" activities for fostering social and economic development may also contribute to increasing adaptive capacities. In fact, there are often overlaps between development practices and adaptation." Reference: McGray et al. (2007) (GERMANY)
451	14	11	9	11	10	Worth mentioning the same "learning" process for institutions as well. (UNITED STATES OF AMERICA)
452	14	11	12	11	19	The current text on informational strategies focuses exclusively on top-down "push" style communications and information dissemination. While these are important, this field of study has increasingly called for more iterative (push and pull) communication approaches that also allow for dialogue between stakeholders and soliciting of inputs from affected communities via ICTs, including radio. (see Harvey, 2011. Climate Airwaves: Community Radio, Action Research and Advocacy for Climate Justice in Ghana. International Journal of Communication. Vol.5.: 2035-2058) (Harvey, Blane, IDRC)
453	14	11	14	11	14	Explain what reverse 911 is. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
454	14	11	14	11	17	Emphasis on computer and modeling, technical as awareness raising - very western perspective. Plenty of other examples that are non-technical, effective, and appropriate to the audience and resources. What is 'reverse 911'? (Rissik, David, Griffith University)
455	14	11	20	11	25	Add under 14.3.3 "migration as an adaptation strategy (as a social option e.g. Tuvalu, Marshall Islands, Maldives, and the difficulties with incorporating climate migrants in locations to which they often relocate such as urban centers in Bangladesh, New Delhi, Mumbai, and other challenged locations (Wilson, Lynn, SeaTrust Institute)
456	14	11	23	11	31	Box 14.1. This is a very strange and inappropriate choice for a case study. It is partly non-climatic, and seems to have no purpose other than to promote the USGS. What does it contribute to the assessment? Delete. (Rissik, David, Griffith University)

#	Ch	From Page	From Line	To Page	To Line	Comment
457	14	11	23	11	31	Box 41.1. More, more diverse and more informative case studies should be included in boxes throughout the chapter. There should be more diversity - from different countries including case from developing countries. (Rissik, David, Griffith University)
458	14	11	25	11	28	Might it be more helpful to give examples of narrative scenarios that give visceral stories that participants can respond to similar to table top exercises but informed by climate projections? See State of Maryland role playing scenarios for climate change. (UNITED STATES OF AMERICA)
459	14	11	25	11	37	This section on 'Scenarios and Public Education' provides information on the scenarios that have been completed in California; however, it does little to provide results, their applicability to adaptation change, or an indication of how these scenarios themselves will facilitate adaptation activities in the areas covered by the scenarios. Suggest bolstering this section further if possible. (CANADA)
460	14	11	43	11	43	"Disconnect your downspout" program needs a one sentence summary on what it is. (UNITED STATES OF AMERICA)
461	14	11	51	11	52	Sentence is not important or should be elaborated. (Trapp, Natalie, University of Hamburg and International Max Planck Research School on Earth System Modelling)
462	14	11	51	11	52	Sentence 1....also how climate adaptation is framed (Funfgeld and McEvoy). How adaptation is framed will have an impact on how adaptation options are selected. See: KH Funfgeld, H. and McEvoy, D, 2011, Framing Climate Change Adaptation in Policy and Practice, Working Paper 1, Victorian Centre for Climate Change Adaptation Research (VCCAR) Working Paper 1 (see Funfgeld and McEvoy 2011_Ch14_P5_L20.pdf); Darryn McEvoy, Hartmut Fünfgeld & Karyn Bosomworth 2013 Resilience and Climate Change Adaptation: The Importance of Framing, Planning Practice and Research, DOI:10.1080/02697459.2013.787710 (Rissik, David, Griffith University)
463	14	11	53	11	54	This needs to be plainer language. (UNITED STATES OF AMERICA)
464	14	12	4	0	0	"Thus" should be deleted. (Rissik, David, Griffith University)
465	14	12	4	0	0	".... by other factors." will be ".... by other factors (Khan et al., 2013)." Reference: Khan, Md.M.R., Miah, S.H. and Irfanullah, H.Md. 2013. Small-scale silage-making technology for the extreme poor on floodplains. International Journal of Environmental Studies 70(2): 192-202. (Irfanullah, Haseeb, Practical Action)
466	14	12	6	12	7	After '... (Sietzet al., 2011).', insert: In assessing the relationship between environmental hazards and labour migration, it is important to understand the process through which a household selects the response strategies to the perceived impacts of environmental hazards. These responses are often the outcome of a household's vulnerabilities as well as its adaptive capacity. A growing consensus suggests that labour migration can be an important strategy for reducing vulnerability to different sources of stress as it helps households diversify their livelihoods. Migration is perceived to be a manifestation of the lack of adaptive capacity, or a strategy of last resort. This perception assumes that people are driven mainly by external shocks or stresses and are passive entities that are unable to use available options to improve existing livelihoods or create new ones. In contrast, all types of migrants consistently display initiative to resolve the challenges they confront. However, as migration requires resources, it may not be an option for some households; particularly the poorest and most vulnerable people are often unable to migrate. (Banerjee et al forthcoming). Related reference: Banerjee, S., JY. Gerlitz, D. Kniveton (2012): A methodology for assessing patterns of labour migration in mountain communities exposed to water hazards. In Faist, T. and J. Schade (Eds.): Disentangling Migration and Climate Change, Chapter 4. Heidelberg / London: Springer International. [Forthcoming] (Molden, David, International Centre for Integrated Mountain Development (ICIMOD))
467	14	12	8	12	20	The emphasis on risk management does not come through as strongly as it should. (UNITED STATES OF AMERICA)
468	14	12	8	30	0	it would be helpful to provide specifi, real examples of how to do traditional adaptation and how to do transformative adaptation (Cheong, So-Min, University of Kansas)

#	Ch	From Page	From Line	To Page	To Line	Comment
469	14	12	13	12	16	Win-win approaches are the same as no-regrest strategies? Difference is not clear or one term is redundant. (Trapp, Natalie, University of Hamburg and International Max Planck Research School on Earth System Modelling)
470	14	12	14	12	19	Brouwer et al (forthcoming) offer further evidence of how climate concerns are being integrated into on-going govt initiatives in the case of the water sector: See Brouwer, S., T. Rayner and D. Huitema (forthcoming). 'Mainstreaming climate policy: the case of climate adaptation and the implementation of EU water policy'. Environment and Planning (C). (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
471	14	12	15	12	16	"Win-win approaches" should also take into consideration "Reducing vulnerability of workers, enterprises and governments to the effect of climate change and enhance capacity at individual and society level to adapt, respond to and prepare for climate change, emphasizing the view that reducing vulnerability must play a central role in adaptation efforts." This is from the ILO's interpretation of the work around Adaptation. (M. Harsdorff, M. Lieuw-Kie Song; K. Philip; M. Tsukamoto. Towards an ILO approach to Climate Change Adaptation, ILO Employment Working Paper No. 104 - Geneva, International Labour Organization, 2011) (Harsdorff, Marek, ILO)
472	14	12	18	12	20	The inclusion of information on adaptation pathways (or links to this if they are to be covered elsewhere) would be helpful here (Street, Roger B, Oxford University)
473	14	12	22	0	0	14.2.3.2. Also worth citing here: Dovers, S.R., Hezri, A.A. (2010). Institutions and policy processes: the means to the ends of adaptation. WIREs Climate Change 1: 212-231. There is slightly more that could be made of the Urwin and Jordan (2008) reference here as well. It highlights how efforts to adapt at local level may be prevented by the existence of policy frameworks/ legislation at higher levels that, although they may at face value have nothing to do with adaptation, in fact impose constraints. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
474	14	12	22	0	30	this paragraph misses references to the respective literature on transformation (Hanger, Susanne, International Institute for Applied Systems Analysis)
475	14	12	22	10	27	Again, the concept of transformation remains quite unclear, despite the effort to define it several times across the chapters. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
476	14	12	22	12	30	There is the assertion that there has been a shift in orientation from traditional to more transformative. By whom? Where? The rational provided is "integration of sustainable development into general conceptualizations of adaptation and from an emphasis on natural evolution to recognition of the centrality of human and policy intervention..." but the meaning here is unclear. The next phrase emphasis "from engineering solutions to a balance of structural, institutional and social measures" is an accurate reflection of discussion in adaptation circles. It is a very important part of the discussion of the adaptation options, and how the options are, and should be, inter-related. But it is not a compelling argument for a wide-ranging shift to "transformational" change. Perhaps if transitional, traditional and incremental were clearly defined - and if the earlier definitions of transformation and incremental were more clear, it would help. (UNITED STATES OF AMERICA)
477	14	12	22	12	30	Not much evidence presented that what we are seeing is a 'shift' in orientation. Is this not an ambition rather than a reality? (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
478	14	12	22	12	46	Would be useful to have some discussion about the pros and cons of traditional approaches (i.e., dealing with short-term threats) and transformational strategies (dealing with long-term or game-changing threats). In what situation is each approach appropriate? What are the risks/benefits associated with each? Other issues that ought to be addressed? (UNITED STATES OF AMERICA)

#	Ch	From Page	From Line	To Page	To Line	Comment
479	14	12	23	12	23	Would be useful to reference Roger Jones work here: The relationship between adaptation and mitigation in managing climate change risks: a regional response from North Central Victoria, Australia Roger N. Jones Æ Paul Dettmann Æ Geoff Park Æ Maureen Rogers Æ Terry White Mitig Adapt Strat Glob Change (2007) 12:685–712 DOI 10.1007/s11027-007-9094-5 - see Fig 3 (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
480	14	12	24	12	24	What about ideas of sustainable adaptation? E.g. :KATRINA BROWN (2011): Sustainable adaptation: An oxymoron?, Climate and Development, 3:1, 21-31 (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
481	14	12	26	12	30	It is unlikely that transformations can be initiated and steered like a plan. They can be seen in hindsight and looking back you can see what made it possible. A group of scientists repeating a message is one of those means. (NETHERLANDS)
482	14	12	28	12	30	Transformation- what does this really look like? Are there some examples to demonstrate i.e. the Transition Towns initiative ? (UNITED STATES OF AMERICA)
483	14	12	32	0	0	What is meant by "traditional"? Do the authors mean incremental? Please be careful with what you mean here. (Rissik, David, Griffith University)
484	14	12	32	0	0	This seems to be a very critical point of the chapter and should be included within the executive summary. (UNITED STATES OF AMERICA)
485	14	12	32	12	46	The 'recommendations' are similar to what elsewhere have been referred to as 'good adaptation principles' - see for example Webb and Beh 2013 - Section 3.1 (reference in earlier comment at page 7, line 23 - and this section also refers to some other sources). Maybe draw on these 'principles' in this paragraph? (Webb, Bob, Australian National University)
486	14	12	34	12	34	It is not just multiple scenarios, but multiple scenarios that include a range of projections that reflects the uncertainties in these projections. (Street, Roger B, Oxford University)
487	14	12	34	12	40	Consideration of iterative management would be helpful. (Ebi, Kristie, ClimAdapt, LLC)
488	14	12	36	12	37	The terminology seems to address the topic of adaptive management without referring to it. It is unclear why adaptive management is not addressed directly in the chapter, but instead references are made such as in this sentence that address the same attributes as adaptive management without addressing the concept directly. (UNITED STATES OF AMERICA)
489	14	12	40	12	40	Perhaps also reference this paper with an emphasis on decision types - to help identify which types of decision require a more comprehensive assessment from those that don't Rethinking adaptation for a 4°C world. Phil. Trans. R. Soc. A 2011 369, doi: 10.1098/rsta.2010.0277, published 29 November 2010 Mark Stafford Smith, Lisa Horrocks, Alex Harvey and Clive Hamilton (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
490	14	12	40	12	46	National public employment programme schemes have a great potential for mainstreaming sector initiatives, and in particular, with efforts in areas of climate mitigation, disaster risk reduction, and sustainable and economic development. See reference, "Many public employment programmes already include projects that are related to conserving or rehabilitating the environment. They can have a large multiplier effect on vulnerable communities by combining the multiple social, environmental and economic objectives of employment generation, income support, and asset creation through the restoration of the natural resource base to reduce the local impacts of climate change, while promoting a rights-based approach to the decent work agenda." (Towards the right to work: A Guidebook for Designing Innovative Public Employment Programmes: PEPs and Green jobs through green works, ILO - Geneva, International Labour Organization, 2012) This would offer an opportunity for being proactive, rather than "reactive" as mentioned on page 13 line 32. (Harsdorff, Marek, ILO)

#	Ch	From Page	From Line	To Page	To Line	Comment
491	14	12	41	12	41	The issue of equity should be featured more prominently here. Improved seeds may help adapting agriculture to cc, but if certain groups do not have access to these seeds for various reasons, they are left behind. This comes together with access to information - if the government supports adaptation activities, and some groups do not know that these activities are existing, they cannot take advantage of it. Sources: Adger et al. (2006). Eriksen & Brown (2011) (GERMANY)
492	14	12	46	0	0	"....2009)." will be "...2009; Khan et al., 2013)." See previous comment for detailed reference. (Irfanullah, Haseeb, Practical Action)
493	14	12	48	0	0	Table 14.3: Very simplistic table, could likely be deleted without loss to the chapter. (Rissik, David, Griffith University)
494	14	12	48	0	0	Authors may wish to increase the discussion on considerations of selecting adaptation options. (Chatterjee, Monalisa, IPCC WGII TSU)
495	14	13	0	0	0	Roles of governments needs to address the point that they address roles that individuals cannot due to large scale of space or time. (UNITED STATES OF AMERICA)
496	14	13	0	17	0	Actors & Roles in Adaptation. Indian sub continent could be a good example for the arguments in this section. Unfortunately, no reference has been made. (INDIA)
497	14	13	0	17	0	"Section 14.4. Actors and Roles in Adaptation": It is a general experience worldwide that the private sector is adept at taking advantage of ongoing schemes in the name of adaptation and creating livelihoods for the poor. The governments and other institutions actively connive with them while the people suffer. (Gupta, Himangana, Panjab University, Chandigarh, India)
498	14	13	0	17	0	I do think that highlighting the research on different roles of actors is very important. However, again I do not think it fits in the middle of this chapter or in this chapter at all, because, as stated before it does not fit with the approved outline for the chapter nor with the overall outline of the report and feels sort of out of place where it stands now. (Hanger, Susanne, International Institute for Applied Systems Analysis)
499	14	13	1	0	0	The actors and roles are not well described. The EEA report on Adaptation makes a much better definition. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
500	14	13	1	0	0	Are roles in transboundary (supra and intranational) adaptation described? The EU has a clear role here, and other regional approaches to adaptation deserve recognition. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
501	14	13	1	0	0	Authors may wish to add a table that provides actors and roles that have emerged as useful. (Chatterjee, Monalisa, IPCC WGII TSU)
502	14	13	1	13	1	Please have the executive summary more accurately reflect this discussion on sectors. (UNITED STATES OF AMERICA)
503	14	13	1	13	1	Should include actors and roles at the regional level (e.g., EU and Asian) (Street, Roger B, Oxford University)
504	14	13	1	17	12	Similarly, section 14.4 lacks information of how the different actors play their roles in practice. (Duan, Juqi, National Climate Center, Chinese Meteorological Administration)
505	14	13	1	17	12	What would be more useful than this rather bland section would be to pull out more clearly the links and interactions between scales of governance. Plenty of refs available - but this one is a good example of what I mean: Global Environmental Change 18 (2008) 180–191 Does public policy support or undermine climate change adaptation? Exploring policy interplay across different scales of governance Kate Urwin, Andrew Jordan (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
506	14	13	1	17	12	Similarly, setion 14.4 lacks information of how the different actors play their roles in pratice. (Shaohong, Wu, Chinese Academy of Agricultural Sciences)
507	14	13	4	13	6	There is a need to include reference to the ability/capacity to identify and address synergies, conflicts and interdependencies. Also successful monitoring and evaluation is also predicted on diverse contributing actors (Street, Roger B, Oxford University)

#	Ch	From Page	From Line	To Page	To Line	Comment
508	14	13	10	0	0	National Adaptation Strategies and their importance are not mentioned, despite being widely recognised as an essential tool. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
509	14	13	10	0	0	Is "state government" a globally-recognised term? State/provincial, maybe? (Rissik, David, Griffith University)
510	14	13	10	0	0	Information on national and state governments also is available in America's Climate Choices: Adapting Panel. (Ebi, Kristie, ClimAdapt, LLC)
511	14	13	10	13	10	Recommend redrafting so this section refers only to "national governments," while the following section (14.4.2) covers local governments. In this section, the text should refer to "regional" or "state and provincial" governments rather than "state" governments. (UNITED STATES OF AMERICA)
512	14	13	12	0	0	National governments play a critical role in defining a national adaptation agenda and promoting it once it is defined. There is also the critical aspect of recognizing and refining programs, rules, and regulations to limit or increase flexibility. (UNITED STATES OF AMERICA)
513	14	13	12	13	19	It would be preferable to provide further citations to support statements in this paragraph, where possible. (Mach, Katharine, IPCC WGII TSU)
514	14	13	12	13	33	Something is required in this section on international relationships as drivers of adaptation. Also, national and state governments are often the ones responsible for ecosystem management, and this needs a mention. (Rissik, David, Griffith University)
515	14	13	17	13	19	This is true in some countries, but not in others - some do, some don't. Perhaps elicit a more clear point. 'even in the absence of national leadership...' rather than what is said here where the reverse may equally be true. Provide more evidence - the roles and responsibility document for Australia could be used as a reference - laying out clear roles for all levels of government. See http://www.climatechange.gov.au/roles-and-responsibilities-climate-change-australia (note this is an html document a pdf can be provided on request) (see Role and Responsibilities_Ch14_P13_L17.pdf) (Rissik, David, Griffith University)
516	14	13	21	13	33	Summary of one article, which is a good paper, but there are lot of other references that could be used here; using only one article has led to an over- simplified argument (Rissik, David, Griffith University)
517	14	13	21	13	33	Authors may consider adding a table to highlight the tendencies of governments observed in studies. (Chatterjee, Monalisa, IPCC WGII TSU)
518	14	13	27	13	33	What is presented here is a very interesting finding. However, the same element is repeated in chapter 15 l. p. 2 l36-47 which gives an impression of redundancy (Dupuis, Johann, Swiss Graduate School of Public Administration (IDHEAP))
519	14	13	36	0	0	The role of local governments in patial planningneeds to be highlighted. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
520	14	13	46	13	53	Corruption also is a challenge. (Ebi, Kristie, ClimAdapt, LLC)
521	14	13	46	13	53	Although potentially to a different degree, are there also not challenges within developed countries. Are there not also examples where local governments are addressing these challenges (e.g., Rotterdam, Copenhagen and within the Covent of Mayors) (Street, Roger B, Oxford University)
522	14	14	1	0	0	Local governments are not identified as implementing adaptation which is more often the case then not. (UNITED STATES OF AMERICA)
523	14	14	9	0	0	Suggest replacing term 'insensitive to rainfall' with 'is heterogeneous in terms of rainfall' as this is term authors use (see page 63, para 2 of Thornton et al., 2009) as this is the term authors use on page 55... (UNITED STATES OF AMERICA)
524	14	14	12	14	12	Role of NGOs in exploring adaptation research and awareness raising (e.g., Joseph Roundtree Foundation) (Street, Roger B, Oxford University)

#	Ch	From Page	From Line	To Page	To Line	Comment
525	14	14	12	14	35	This section on Local Civil Society and Nongovernmental Organisations should refer to the findings of A national study of Community Service Organisations in Australia (Mallon et al, 2013). This study found that while the CSOs are willing to assist clients and the broader community with their adaptive capacity, "few CSO's have taken significant action to prepare for climate change and worsening extreme weather events". CSOs were found to be "highly vulnerable and not well prepared to respond" to the associated potential impacts to physical infrastructure they rely on. This increases the vulnerability of people who are experiencing poverty or other disadvantages and rely on community services provided by these organisations. The study suggests ways to assist CSOs ti overcome identified barriers to their adoption of adaptation action. Citation: Mallon, K., E. Hamilton, M. Black, B. Beem, J. Abs, 2013: Adapting the community sector for climate extremes, National Climate Change Adaptation Research Facility, Gold Coast, pp. 286. Available at: www.nccarf.edu.au/sites/default/files/attached_files_publications/Mallon-Adapting-Community-Sector-Climate-Extremes.pdf (AUSTRALIA)
526	14	14	12	14	35	Should discuss not only the role of civil society but also the vulnerability of its institutions. See Mallon, K, Hamilton, E, Black, M, Beem, B, Abs, J 2013 Adapting the community sector for climate extremes, National Climate Change Adaptation Research Facility, Gold Coast, pp. 286. http://www.nccarf.edu.au/sites/default/files/attached_files_publications/Mallon-Adapting-Community-Sector-Climate-Extremes.pdf (see Mallon etal 2013_Ch14_P14_L12.pdf) (Rissik, David, Griffith University)
527	14	14	12	14	35	Risk of maladaptation for each actors could also be mentioned. Short term and long term scope of the actors will also be useful here. (Chatterjee, Monalisa, IPCC WGII TSU)
528	14	14	28	14	30	Rephrase the sentence so sounds less condescending - to reflect the partnership rather than teachings. Suggest remove the word "teaching" and emphasise the co-generation of knowledge. (Rissik, David, Griffith University)
529	14	14	38	0	0	It will be very useful if one of the key messages from this section highlighted how the approach of international organization and institutions is evolving/ expanding. (Chatterjee, Monalisa, IPCC WGII TSU)
530	14	15	1	15	5	Although maladaptive adaptation is covered later in the chapter, it seems as though there really needs to be a reference to it here. Some development initiatives, especially focused on short-term indicators, may not take into account some of the risks to the portfolio from climate change either in the short- or the long-term and instead may encourage maladaptive activities. (UNITED STATES OF AMERICA)
531	14	15	1	15	5	Consideration of the role of social capital would be informative. (Ebi, Kristie, ClimAdapt, LLC)
532	14	15	5	0	0	"....2009)" will be "....2009; Khan et al., 2013)." See previous comment for detailed reference. (Irfanullah, Haseeb, Practical Action)
533	14	15	8	0	0	For clarity, suggest inserting 'intercellular' before ' ..CO2-induced increases in stomatal resistance' so it is clear that trigger for change in resistance is intercellular CO2. See Ainsworth and Rogers 2007 Plant Cell Environ 30: 258-270 (UNITED STATES OF AMERICA)
534	14	15	10	15	12	Text belongs in 14.4.3 or make a distinction (Rissik, David, Griffith University)
535	14	15	10	15	36	The role of customary institutions in enabling local-level adaptation and their interaction with formal government institutions has not been covered in this chapter and this section in particular. (NETHERLANDS)
536	14	15	11	15	12	It is confusing to mention one approach when other approaches are not explicitly given in the chapter. Perhaps a table that identifies all approaches and its actors will be useful for the readers. (Chatterjee, Monalisa, IPCC WGII TSU)
537	14	15	13	15	19	"Community based adapaptation" has some smilarities with the participatory approaches that were used in the 1990's with the "Special Public Works Programmes" which very much focused on local approaches using appropriate technology that were environmentally friendly. Would it not be worth mentioning some of these programmes? (Harsdorff, Marek, ILO)

#	Ch	From Page	From Line	To Page	To Line	Comment
538	14	15	14	0	0	For clarity and because as written the sentence elides role of canopy architecture in difference between canopy and leaf analyses, suggest deleting words ' dry vs wet' so sentence reads '...expected leaf-level signal.' (UNITED STATES OF AMERICA)
539	14	15	21	0	0	This paragraph is constructed in the vulnerability literature. Many communities will rightly say they have a long history of adaptation. Perhaps include sentence that says communities are not only participating in vulnerability but also adaptation actions. (Rissik, David, Griffith University)
540	14	15	21	15	22	Kienberger 2012, also reviewed participatory assessment methods at the community and district level and also present a methodology to integrate community perceptions in spatial vulnerability maps. Kienberger, S., 2012. Spatial modelling of social and economic vulnerability to floods at the district level in Búzi, Mozambique. Natural Hazards 64(3), 2011-2019. http://dx.doi.org/10.1007/s11069-012-0174-9 (Kienberger, Stefan, University of Salzburg)
541	14	15	21	15	28	This paragraph is not a critical assessment of literature - too much of a list. Perhaps an analytical last sentence could solve this, indicating whether these initiatives have been successful or not, positive in their contribution or not. (Rissik, David, Griffith University)
542	14	15	30	15	30	Suggest removing the word "can." (CANADA)
543	14	15	30	15	36	This passage needs elaboration. (UNITED STATES OF AMERICA)
544	14	15	36	0	0	remove "was" (mistyping) (VIETNAM)
545	14	15	36	15	36	Suggest removing the word "then." (CANADA)
546	14	15	37	15	37	Household information of the community indicates that farmers of the hazardour prone areas such as flood effected community have been progressively losing their agricultural lands due to climatic extremes resulting in poverty over time (Younus, 2010). Within the past 20 years the size of typical farms has been reduced by more than half. This suggests that the affected farmers have been forced to become environmental refugees over time. If this trend continues in developing countries such as Bangladesh then the overall human security in the Asia Pacific Region could be severely threatened due to illegal migration. As a result such illegal migrations from Bangladesh to neighbouring countries India, South East Asia as well as in Australia and New Zealand could markedly rise (Younus, 2012). (Younus, Md, Lecturer, School of the Environment, Flinders University, Research Fellow, Adelaide University, South Australia)
547	14	15	41	0	0	Households are not frontline decision-makers for ecosystems. This persistent ignoring of ecosystems as an important compnent of adaptation is unfortunate, to say the least. (Rissik, David, Griffith University)
548	14	15	41	15	41	Implementation of adaptation actions is often local in nature. There is a need for adaptation at different levels - coordinated and consistent. (Street, Roger B, Oxford University)
549	14	15	42	0	0	change to " suffer" (replace for "suffering") (VIETNAM)
550	14	15	45	15	46	On the importance of fostering institutions for coordination, communication etc, refer also to Pittock, J. (2011). National climate change policies and sustainable water management: conflicts and synergies. Ecology and Society 16(2): 25. [online] URL: http://www.ecologyandsociety.org/vol16/iss2/art25/ (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
551	14	15	48	15	54	This material could consider and cross-reference the relevant assessment of chapters 9 and 13. (Mach, Katharine, IPCC WGII TSU)
552	14	15	49	15	49	Please define consumption smoothing? (UNITED STATES OF AMERICA)
553	14	15	54	15	54	It might be useful to note that in countries where the governments "bail out" their citizens frequently on a macro scale governments can also fall into a poverty or austerity trap due to frequent expensive extreme weather events. (UNITED STATES OF AMERICA)

#	Ch	From Page	From Line	To Page	To Line	Comment
554	14	16	0	16	0	Private sector – the role of insurance sector, which is emerging as a critical adaptation option has not been highlighted (INDIA)
555	14	16	1	0	0	"The role of the private sector is fundamental in delivering adaptive changes" is the first use of this phrase. Is the intent here that private sector is necessary to adapt or what exactly are they delivering? (UNITED STATES OF AMERICA)
556	14	16	3	0	0	Why only in Arab countries? Global phenomenon. (Rissik, David, Griffith University)
557	14	16	3	0	0	Advantages in migration as well as disadvantages PH DK (Rissik, David, Griffith University)
558	14	16	6	16	7	add at the end of the sentence "and food insecurity (HLPE 2012)." The reference is: HLPE, 2012. Social protection for food security. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome 2012. http://www.fao.org/cfs/cfs-hlpe/reports/en/ (Yao, Xiangjun, Food and Agriculture Organization of the United Nations (FAO))
559	14	16	7	16	7	After citations add "Education programs for children, particularly those that encourage interaction with parents and caregivers, have been shown to increase household preparedness and increase emotional resilience (e.g., reduced fears of hazardous events), across a range of extreme events (e.g., Ronan, Crellin, Johnston, 2012; Ronan & Johnston, 2003). Citations: Ronan, K.R, Crellin, K., & Johnston, D. M. (2012). Community readiness for a new tsunami warning system: Quasi-experimental and benchmarking evaluation of a school education component. Natural Hazards, 61(3), 1411-1425.; Ronan, K.R. & Johnston, D. M. (2003). Hazards education for youth: A quasi-experimental investigation. Risk Analysis, 23, 1009-1020. (Ronan, Kevin, CQUniversity Australia)
560	14	16	10	0	0	It is not clear how this community fits in the flow of this section. Perhaps a box instead of a sub section will be more effective. (Chatterjee, Monalisa, IPCC WGII TSU)
561	14	16	10	16	25	This section does not contain too much information. It just makes a few very general statements without proving them or giving references - e.g., there is no concrete example or reference for the statements in the sentence starting in line 12 "Many live in locations...". The sentence starting in line 15 has at least one reference, although it contains several statements that would need proof. Either give more detail with regard to indigenous people or keep it short and general, but then put it under communities (14.4.5). Or delete the text on indigenous people completely by referring to section 12.3.3. (GERMANY)
562	14	16	10	16	25	Relevant example includes See Russell-Smith et al. (in press) Can savanna burning projects deliver measurable greenhouse emissions reductions, and sustainable livelihood opportunities for indigenous and local communities, in fire-prone settings? In Journal of Climatic Change Special Issue on Climate Change Mitigation and Adaptation with Local Communities and Indigenous Peoples (Ramos Castillo, Ameyali, United Nations University - Institute of Advanced Studies)

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563	14	16	10	16	25	References in this section not very representative. Here are some additional references. Asia Indigenous Peoples Pact. 2011. Indigenous peoples and climate change adaptation in Asia, AIPP and EU Publication Bardsley, DK, Wiseman, ND 2012, 'Climate change vulnerability and social development for remote indigenous communities of South Australia', Global Environmental Change, Vol. 22, No. 3, pp. 713-723. Dinero, S 2013, 'Indigenous perspectives of climate change and its effects upon subsistence activities in the Arctic: the case of the Nets'aii Gwich'in', GeoJournal, vol. 78, no. 1, pp. 117-137. Ford, J, Pearce, T, Duerden, F, Furgal, C, Smit, B 2010, 'Climate change policy responses for Canada's Inuit population: the importance of and opportunities for adaptation', Global Environmental Change, vol. 20, no. 1, pp. 177-191. Green, G, Niall, S & Morrison, J 2012, 'Bridging the gap between theory and practice in climate change vulnerability assessments for remote Indigenous communities in northern Australia, Local Environment: The International Journal of Justice and Sustainability, vol. 17, no. 3, pp. 295-315. Kalanda-Joshua, M, Ngongondo, C, Chipeta, L & Mpembeka, I 2012, 'Integrating indigenous knowledge with conventional science: enhancing localised climate and weather forecasts in Nessa, Mulanje, Malawi', Physics and Chemistry of the Earth, vol. 36, no. 14-15, pp. 996-1003. Macchi, M 2008, Indigenous and Traditional Peoples and Climate Change, IUCN Issues Paper, IUCN.(see Macchi 2008_Ch14_P16_L10.pdf) McNamara, K & Westoby, R 2011, 'Local knowledge and climate change adaptation on Erub Island, Torres Strait', Local Environment: The International Journal of Justice and Sustainability, vol. 16, no. 9, pp. 887-901. Petheram, L, Zander, K, Cambell, B, High, C & Stacey, N, 2010, 'Strange changes': Indigenous perspectives of climate change and adaptation in NE Arnhem Land (Australia)', Global Environmental Change, vol. 20, no. 4, pp. 681-692. Thomas, D & Twyman, C 2005, 'Equity and justice in climate change adaptation amongst natural-resource-dependent societies', Global Environmental Change, vol. 15, no. 2, pp. 115-124. Turner, NJ & Clifton, H 2009, "'It's so different today": Climate change and indigenous lifeways in British Columbia, Canada', Global Environmental Change, vol. 19, no. 2, pp. 180-190. Turner, NJ, Davidson-Hunt, IJ & O'Flaherty, M 2003, 'Living on the edge: ecological and cultural edges as sources of diversity for social- ecological resilience', Human Ecology, vol. 31, no. 3, pp.439-461. (Rissik, David, Griffith University)

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564	14	16	12	0	0	References in this section not very representative. Here are some additional references. Asia Indigenous Peoples Pact. 2011. Indigenous peoples and climate change adaptation in Asia, AIPP and EU Publication Bardsley, DK, Wiseman, ND 2012, 'Climate change vulnerability and social development for remote indigenous communities of South Australia', Global Environmental Change, Vol. 22, No. 3, pp. 713-723. Dinero, S 2013, 'Indigenous perspectives of climate change and its effects upon subsistence activities in the Arctic: the case of the Nets'aii Gwich'in', GeoJournal, vol. 78, no. 1, pp. 117-137. Ford, J, Pearce, T, Duerden, F, Furgal, C, Smit, B 2010, 'Climate change policy responses for Canada's Inuit population: the importance of and opportunities for adaptation', Global Environmental Change, vol. 20, no. 1, pp. 177-191. Green, G, Niall, S & Morrison, J 2012, 'Bridging the gap between theory and practice in climate change vulnerability assessments for remote Indigenous communities in northern Australia, Local Environment: The International Journal of Justice and Sustainability, vol. 17, no. 3, pp. 295-315. Kalanda-Joshua, M, Ngongondo, C, Chipeta, L & Mpembeka, I 2012, 'Integrating indigenous knowledge with conventional science: enhancing localised climate and weather forecasts in Nessa, Mulanje, Malawi', Physics and Chemistry of the Earth, vol. 36, no. 14-15, pp. 996-1003. Macchi, M 2008, Indigenous and Traditional Peoples and Climate Change, IUCN Issues Paper, IUCN. McNamara, K & Westoby, R 2011, 'Local knowledge and climate change adaptation on Erub Island, Torres Strait', Local Environment: The International Journal of Justice and Sustainability, vol. 16, no. 9, pp. 887-901. Petheram, L, Zander, K, Cambell, B, High, C & Stacey, N, 2010, 'Strange changes': Indigenous perspectives of climate change and adaptation in NE Arnhem Land (Australia)', Global Environmental Change, vol. 20, no. 4, pp. 681-692. Thomas, D & Twyman, C 2005, 'Equity and justice in climate change adaptation amongst natural-resource-dependent societies', Global Environmental Change, vol. 15, no. 2, pp. 115-124. Turner, NJ & Clifton, H 2009, "'It's so different today": Climate change and indigenous lifeways in British Columbia, Canada', Global Environmental Change, vol. 19, no. 2, pp. 180-190. Turner, NJ, Davidson-Hunt, IJ & O'Flaherty, M 2003, 'Living on the edge: ecological and cultural edges as sources of diversity for social- ecological resilience', Human Ecology, vol. 31, no. 3, pp.439-461. (Rissik, David, Griffith University)
565	14	16	12	0	0	This sentence ("Indigenous actors are in a particular position in relation to climate change") could be strengthened. (CANADA)

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566	14	16	12	0	25	References in this section not very representative. Here are some additional references. Asia Indigenous Peoples Pact. 2011. Indigenous peoples and climate change adaptation in Asia, AIPP and EU Publication Bardsley, DK, Wiseman, ND 2012, 'Climate change vulnerability and social development for remote indigenous communities of South Australia', Global Environmental Change, Vol. 22, No. 3, pp. 713-723. Dinero, S 2013, 'Indigenous perspectives of climate change and its effects upon subsistence activities in the Arctic: the case of the Nets'ait Gwich'in', GeoJournal, vol. 78, no. 1, pp. 117-137. Ford, J, Pearce, T, Duerden, F, Furgal, C, Smit, B 2010, 'Climate change policy responses for Canada's Inuit population: the importance of and opportunities for adaptation', Global Environmental Change, vol. 20, no. 1, pp. 177-191. Green, G, Niall, S & Morrison, J 2012, 'Bridging the gap between theory and practice in climate change vulnerability assessments for remote Indigenous communities in northern Australia, Local Environment: The International Journal of Justice and Sustainability, vol. 17, no. 3, pp. 295-315. Kalanda-Joshua, M, Ngongondo, C, Chipeta, L & Mpembeka, I 2012, 'Integrating indigenous knowledge with conventional science: enhancing localised climate and weather forecasts in Nessa, Mulanje, Malawi', Physics and Chemistry of the Earth, vol. 36, no. 14-15, pp. 996-1003. Macchi, M 2008, Indigenous and Traditional Peoples and Climate Change, IUCN Issues Paper, IUCN. McNamara, K & Westoby, R 2011, 'Local knowledge and climate change adaptation on Erub Island, Torres Strait', Local Environment: The International Journal of Justice and Sustainability, vol. 16, no. 9, pp. 887-901. Petheram, L, Zander, K, Cambell, B, High, C & Stacey, N, 2010, 'Strange changes': Indigenous perspectives of climate change and adaptation in NE Arnhem Land (Australia)', Global Environmental Change, vol. 20, no. 4, pp. 681-692. Thomas, D & Twyman, C 2005, 'Equity and justice in climate change adaptation amongst natural-resource-dependent societies', Global Environmental Change, vol. 15, no. 2, pp. 115-124. Turner, NJ & Clifton, H 2009, "'It's so different today": Climate change and indigenous lifeways in British Columbia, Canada', Global Environmental Change, vol. 19, no. 2, pp. 180-190. Turner, NJ, Davidson-Hunt, IJ & O'Flaherty, M 2003, 'Living on the edge: ecological and cultural edges as sources of diversity for social- ecological resilience', Human Ecology, vol. 31, no. 3, pp.439-461. (Rissik, David, Griffith University)
567	14	16	12	12	25	Presumably indigenous knowledge in both developed as well as developing countries should be considered on this basis? Or is there a cut-off line imposed by researchers? (Bunce, Matthew, Institute of Marine Engineering, Science and Technology)
568	14	16	12	16	12	This first sentence is awkward. "Indigenous actors" can mean people pretending to be indigenous and "particular position" is non-descriptive of their situation. The sentence could read, "Indigenous peoples are particularly vulnerable to climate change" or "threatened by climate change." (Rosales, Jon, St. Lawrence University)
569	14	16	12	16	12	Recommend adding more detail to explain or expand upon what is meant by "particular position" as it is referenced in this sentence. (UNITED STATES OF AMERICA)
570	14	16	12	16	12	The 1st sentence of this paragraph should be clarified. (Mach, Katharine, IPCC WGII TSU)
571	14	16	12	16	25	The points made in Section 14.4.7 regarding Indigenous People apply similarly to all people. (UNITED STATES OF AMERICA)
572	14	16	14	0	0	"....to a changing climate." will be "....to a changing climate (Irfanullah and Motaleb, 2011)." Reference: Irfanullah, H.Md. and Motaleb, M.A. 2011. Reading nature's mind: disaster management by indigenous peoples of Bangladesh. Indian Journal of Traditional Knowledge 10(1): 80-90. (Irfanullah, Haseeb, Practical Action)
573	14	16	14	16	15	Suggest inserting 'socially' as a third consideration - perhaps the toughest consideration to mitigate for in any meaningful way: "As such they are often politically, economically and socially marginalized and face substantial risks" (Callihoo, Christine, Canadian Institute of Planners (CIP))

#	Ch	From Page	From Line	To Page	To Line	Comment
574	14	16	15	16	16	After ‘... change (12.3)’ , insert: People and societies in the greater Himalayas are diverse and heterogeneous. The region is home to 213 million people from a diverse array of ethnic groups who speak a variety of languages. Of these, 22 per cent are indigenous peoples. Most indigenous peoples and mountain communities in the region depend on local biological resources for cultural, spiritual, medicinal, and food security purposes (Khadka and Verma, 2012). They Indigenous Peoples ‘... ctd ..’ . Related reference: Khadka, M., R. Verma, 2012: Gender and biodiversity management in the greater Himalayas: Towards equitable mountain development. Kathmandu, ICIMOD. (Molden, David, International Centre for Integrated Mountain Development (ICIMOD))
575	14	16	18	16	19	After ‘... neglect (12.3.3)’ , insert: In the northwest part of the Swat District in Pakistan, women have a rich indigenous knowledge of medicinal plants. This is because 90 per cent of the medicinal herbs are collected by indigenous women and children (Hamayun et al. 2005). Related reference: Hamayun, M; SA. Khan,I. Iqbal, G. Rehman, T. Hayat, MA. Khan, (2005): Ethnobotanical profile of Utror and Gabral valleys, District Swat, Pakistan. http://ethnoleaflets.com/leaflets/swat.htm (Accessed 13.5.2013) (Molden, David, International Centre for Integrated Mountain Development (ICIMOD))
576	14	16	20	0	0	References in this section not very representative. Here are some additional references. Asia Indigenous Peoples Pact. 2011. Indigenous peoples and climate change adaptation in Asia, AIPP and EU Publication Bardsley, DK, Wiseman, ND 2012, ‘Climate change vulnerability and social development for remote indigenous communities of South Australia’, Global Environmental Change, Vol. 22, No. 3, pp. 713-723. Dinero, S 2013, ‘Indigenous perspectives of climate change and its effects upon subsistence activities in the Arctic: the case of the Nets’aii Gwich’in’, GeoJournal, vol. 78, no. 1, pp. 117–137. Ford, J, Pearce, T, Duerden, F, Furgal, C, Smit, B 2010, ‘Climate change policy responses for Canada’s Inuit population: the importance of and opportunities for adaptation’, Global Environmental Change, vol. 20, no. 1, pp. 177–191. Green, G, Niall, S & Morrison, J 2012, ‘Bridging the gap between theory and practice in climate change vulnerability assessments for remote Indigenous communities in northern Australia, Local Environment: The International Journal of Justice and Sustainability, vol. 17, no. 3, pp. 295-315. Kalanda-Joshua, M, Ngongondo, C, Chipeta, L & Mpembeka, I 2012, ‘Integrating indigenous knowledge with conventional science: enhancing localised climate and weather forecasts in Nessa, Mulanje, Malawi’, Physics and Chemistry of the Earth, vol. 36, no. 14-15, pp. 996–1003. Macchi, M 2008, Indigenous and Traditional Peoples and Climate Change, IUCN Issues Paper, IUCN. McNamara, K & Westoby, R 2011, ‘Local knowledge and climate change adaptation on Erub Island, Torres Strait’, Local Environment: The International Journal of Justice and Sustainability, vol. 16, no. 9, pp. 887-901. Petheram, L, Zander, K, Cambell, B, High, C & Stacey, N, 2010, ‘Strange changes’: Indigenous perspectives of climate change and adaptation in NE Arnhem Land (Australia), Global Environmental Change, vol. 20, no. 4, pp. 681-692. Thomas, D & Twyman, C 2005, ‘Equity and justice in climate change adaptation amongst natural-resource-dependent societies’, Global Environmental Change, vol. 15, no. 2, pp. 115–124. Turner, NJ & Clifton, H 2009, ‘“It’s so different today”: Climate change and indigenous lifeways in British Columbia, Canada’, Global Environmental Change, vol. 19, no. 2, pp. 180-190. Turner, NJ, Davidson-Hunt, IJ & O’Flaherty, M 2003, ‘Living on the edge: ecological and cultural edges as sources of diversity for social– ecological resilience’, Human Ecology, vol. 31, no. 3, pp.439-461. (Rissik, David, Griffith University)
577	14	16	30	16	30	To replace "fundamental" with "important". Furthermore, add "However, there is market failure due to less business return in adaptation investment" after the first sentence. (Duan, Juqi, National Climate Center, Chinese Meteorological Administration)
578	14	16	30	16	30	What exactly do the authors mean with 'adaptive changes'? It sounds a bit like pleonasm. I suggest to change the text in ‘... in delivering adaptation’ or ‘through mainstreaming adaptation in their operations and by capitalizing on climate change adaptation needs, the private sector plays [or can play] a crucial role in adaptation’ (Pauw, Willem Pieter, German Development Institute (DIE))

#	Ch	From Page	From Line	To Page	To Line	Comment
579	14	16	30	17	12	Mining industry is also at risk. This can be seen from impact of 2011 floods in Queensland, Australia where 85% of all coal mines were shut down costing \$2.5 billion. Smith, M.H. (2013) Assessing climate change risks and opportunities for investors: Mining and minerals processing sector. Investor Group on Climate Change. http://www.igcc.org.au/assessing_risks (Rissik, David, Griffith University)
580	14	16	33	0	37	Not a critical statement about the literature, reliance on a single report. Needs further support and analysis. (Rissik, David, Griffith University)
581	14	16	33	15	37	The KPMG report can be expanded a bit because such studies by private consulting companies are rare and provide diversity of application. (Nair, Malini, Indian Institute of Science)
582	14	16	39	16	47	Authors may wish to add the overall experience of these three ways of involvement in the discussion. (Chatterjee, Monalisa, IPCC WGII TSU)
583	14	16	40	16	41	See comments on Figure 14.1 (Street, Roger B, Oxford University)
584	14	16	40	16	45	I would argue that the second way is part of the first and the third and I do not see why this is a separate category. (Pauw, Willem Pieter, German Development Institute (DIE))
585	14	16	44	16	47	link should be made to the adaptation economy (Street, Roger B, Oxford University)
586	14	16	45	16	47	I agree with the phrase 'even in developing countries...', but the word 'even' should be explained, for example by stating that developing countries often have unattractive business environments, undeveloped markets, inadequate regulation, etc. We touch upon this issue in a forthcoming publication in Climate and Development (2nd draft under review) (Pauw, Willem Pieter, German Development Institute (DIE))
587	14	16	49	16	50	Fig 14.1: Does not add anything. Just text in a series of blobs. Suggest include in text. (Rissik, David, Griffith University)
588	14	16	53	0	0	Uncritical statement "on a par with terrorism". Suggest remove these words. (Rissik, David, Griffith University)
589	14	17	0	17	0	Adaptation Assessment: No reference to Participatory Vulnerable Assessment (PVA). The section is devoid of concrete examples and the specific assessment tools. (INDIA)
590	14	17	0	19	0	Would it be possible to add a section or a box with "Good Practices" of adaptation assessments? Chapter 14.5 is rather abstract and provides just general trends, frameworks and guidance for adaptation assessments. And I totally agree with the UKCIP's framework for vulnerability and adaptation assessments. But it would be really nice to learn from all the experiences with assessments and actual applications of all these frameworks and guidances. (Puetz, Marco, Swiss Federal Institute for Forest, Snow and Landscape Research WSL)
591	14	17	0	19	0	While other aspects that were not in the approved outline have received prominent attention in this chapter the sub-chapter on assessments has been very much neglected. The information on assessments is extremely superficial in each of the sub-sections. The different types of assessments should be better distinguished and described as well as the trends for each type of assessment not only in broad terms, but also the technical and methodological advances should be included as well as the particular advantages and disadvantages for each type of assessment. the meaning of assessments at different scales is almost entirely missing or at least lost among other contents. The section on national assessments, only describes the policies in place but does not include any evaluation of the processes over the past decade. A small but diversified set of case studies could help as illustration. (Hanger, Susanne, International Institute for Applied Systems Analysis)
592	14	17	1	17	1	slow in emerging - willingness and ability to be part of the adaptation community - sharing knowledge and experiences (Street, Roger B, Oxford University)
593	14	17	1	17	12	Could be useful to have two case studies of industries/companies that do account for such risk and don't account for such risk, and show some analysis of what the repercussions for the company's bottom line may be. (UNITED STATES OF AMERICA)

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594	14	17	2	0	0	Direct quote from report - all or many companies? Not a critical statement; reliance on a single report; needs further support and analysis. Suggest consider this reference: West, JM and Brereton, D 2013 Climate change adaptation in industry and business National Climate Change Adaptation Research Facility, Gold Coast, pp.144.(see West&Brereton 2013_Ch14_P17_L2.pdf) (Rissik, David, Griffith University)
595	14	17	3	17	5	Most of the private sector...' I think it is problematic to make this statement without further defining what kind of private sector is meant. There are massive differences between smallholder farmers, SMEs and multinationals, for example, and massive differences between insurance companies (already quite active) and water, construction, mining or health sectors. There has been little research in this field and therefore it is difficult to make the kind of statements as the done by the authors. I would also advice the authors to have a look at the NWP private sector initiative and the UN Global compact survey (United Nations Global Compact et al. (2011). Adapting for a green economy: companies, communities and climate change. A Caring for Climate Report. http://www.unglobalcompact.org/docs/issues_doc/Environment/climate/C4C_Report_Adapting_for_Green_Economy.pdf (Pauw, Willem Pieter, German Development Institute (DIE))
596	14	17	3	17	5	Need for a business case for adaptation (Street, Roger B, Oxford University)
597	14	17	6	0	7	This sentence should include confronting the costs of inaction. (UNITED STATES OF AMERICA)
598	14	17	7	17	9	This is an important sentence to keep in the report. However, the discussion is still very much in its infancy - for example the circumstances under which the PS could be supported, what kind of PS, and under what conditions (prevent unfair competition, loans or grants, ...) and aims (e.g. job creation, wider sustainability aims, wider co-benefits of e.g. water use reduction measures). Second, I know that the PPCR pilot in Zambia struggles with the question of how to involve the private sector in adaptation. Making them implement a project is rather simple, but to make a business model is something completely different. Therefore, I would change the sentence in 'Also, there are still questions of whether adaptation finance COULD be made available to the private sector in developing countries, AND UNDER WHAT AIMS AND CONDITIONS. (Pauw, Willem Pieter, German Development Institute (DIE))
599	14	17	15	0	0	What is an adaptation assessment? Authors should consider use of Fünfgeld H. & D. McEvoy (2011) Framing Climate Change Adaptation in Policy and Practice, VCCCAR working paper 1, VCCCAR, Australia. ISBN 978 0 7340 4417 4 for this section. (Rissik, David, Griffith University)
600	14	17	15	0	0	Section 14.5: uncertainty issues should be addressed in this section, as they are an inherent part of assessments. (ITALY)
601	14	17	20	0	0	Using the word "mitigate" in this context is confusing. Suggest use "reduce" in place. (Rissik, David, Griffith University)
602	14	17	26	17	27	Bottom up assessments often can't use information about climate outcomes effectively, as well. (UNITED STATES OF AMERICA)
603	14	17	33	17	33	Could help the reader if a list of assessments was included in an appendix. (UNITED STATES OF AMERICA)
604	14	17	36	0	0	It will be useful to have key messages from the trends in assessment section in a table. The table could also synthesize findings from subsequent sub sections and provide benefits and shortcomings of approaches employed. (Chatterjee, Monalisa, IPCC WGII TSU)
605	14	17	36	18	24	14.5.2 Trends in Assessment: The author team is strongly encouraged to use figures and tables to present key and synthesized findings where ever possible. This section may be a good place to use a figure or table to illustrate different approaches for the assessments of climate impacts, vulnerability and adaptation. Use the Figure 14-2 as a basis frame work, the author team can further develop a figure to highlight the characteristics of each approach depicted in the section. TSU can help develop such a figure. (Estrada, Yuka, IPCC WGII TSU)

#	Ch	From Page	From Line	To Page	To Line	Comment
606	14	17	38	17	44	Three frameworks seem out of order. Aren't impact based assessments and vulnerability based approaches similar in that they define the issues/locations/populations who need to be the focus of activities? And adaptation based approaches sound like options analyses, where you're trying to figure out how effective different approaches may be -- i.e. a later step in the adaptive process. Once you isolate the important issue to take on, then you can better explore options. (UNITED STATES OF AMERICA)
607	14	17	41	17	45	I do not like the word 'funding' here and would replace it with investments. The word funding suggests that the private sector could replace public funding, yet they have very different motivation to engage in adaptation. Furthermore, the term funding is too strongly related to the adaptation finance debate, where the role of the private sector is increasingly referred to but heavily disputed. Developing countries often consider climate finance as compensation and want public grants rather than private loans and equity. And a smallholder farmer that invests in adaptation would also not be a developed country climate finance contribution. Yes I agree that the private sector has an important role in adaptation, but rather in terms of activities and investment than in terms of funding. Another point is that insurance is an important risk sharing instrument that also incentivises people and societies to apply adaptation measures proactively, but it does not bring in any new financial resources for adaptation. (Pauw, Willem Pieter, German Development Institute (GDI))
608	14	18	2	18	2	Casual usage of "likely" should be avoided, as it is a reserved likelihood term. Other synonyms could be "potential," "possible," or "probable." (Mach, Katharine, IPCC WGII TSU)
609	14	18	10	18	10	Here or elsewhere where "vulnerability assessment" is defined, could note something on risk assessments: The term risk assessment is sometimes used; however, it is difficult to carry out a true risk assessment in part because it is not possible to quantify the likelihood of different GHG pathways (over the longer term) and the resulting climate effects. (UNITED STATES OF AMERICA)
610	14	18	10	18	12	Suggest citing Fussler and Klein (2006) here. Fussler, H. M.; Klein, R.T. 2006. Climate change vulnerability assessments: An evolution of conceptual thinking. Clim. Chang. 75:301–329 (CANADA)
611	14	18	13	18	14	Insert: The International Centre for Integrated Mountain Development (ICIMOD) has developed a household survey instrument to assess poverty, vulnerability to climate change, and adaptive capacity This instrument has been implemented in several representative surveys interviewing more than 13,000 households of the Hindu Kush Himalaya region (Gerlitz et al forthcoming). Related reference: Gerlitz, J-Y., S. Banerjee, B. Hoermann, K. Hunzai, M. Macchi, (forthcoming): Poverty, Vulnerability, and Adaptive Capacity – A Mountain Specific Survey Instrument. Kathmandu, ICIMOD. (Molden, David, International Centre for Integrated Mountain Development (ICIMOD))
612	14	18	18	18	20	Please cite examples of such institutional assessments, that have been developed since the AR4: For example Gupta, J., Termeer, K., Klostermann, J., Meijerink, S., van den Brink, M., Jong, P., Nootboom, S., and Bergsma, E.: The Adaptive Capacity Wheel: a method to assess the inherent characteristics of institutions to enable the adaptive capacity of society, Environ Sci Pol, 13(6), 459-471, 2010. Grothmann, T., Grecksch, K., Winges, M., and Siebenhüner, B. (2013). Assessing institutional capacities to adapt to climate change – integrating psychological dimensions in the Adaptive Capacity Wheel. Nat. Hazards Earth Syst. Sci. Discuss., 1, 793-828. Huntjens, P., Lebel, L., Pahl-Wostl, C., Camkin, J., Schulze, R., Kranz, N.: Institutional design propositions for the governance of adaptation to climate change in the water sector. Global Environ Chang, 22(1), 67-81, 2012. (Grothmann, Torsten, Carl von Ossietzky University of Oldenburg)
613	14	18	23	18	24	Figure 14.2: This figure is quite old now. Worth looking at Park et al 2012 nice figure of adaptation framework that includes transformation. Park, S. E., Marshall, N. A., Jakku, E., Dowd, A. M., Howden, S. M., Mendham, E. & Fleming, A. 2012 Informing adaptation responses to climate change through theories of transformation. Global Environmental Change 22, 115-126. (Rissik, David, Griffith University)
614	14	18	27	18	27	Is there not also an evaluating issue associated with understanding the impacts of an assessment - what is a successful assessment (Street, Roger B, Oxford University)

#	Ch	From Page	From Line	To Page	To Line	Comment
615	14	18	27	19	6	issues and tensions' identified in this section could also be related to or described as 'challenges' as identified in some other studies - see for example Webb, R. J., R. McKellar and R. Kay, 2013. Climate change adaptation in Australia: Experience, challenges and capacity building, (Submitted, in second stage review - will send as separate attachment) (Webb, Bob, Australian National University)
616	14	18	29	0	0	why are only 3 tensions included in the assessment, without providing an explanation or giving an overview of the whole list of advantages and disadvantages of assessments (which should be done by type of assessment and not for assessments in general) (Hanger, Susanne, International Institute for Applied Systems Analysis)
617	14	18	30	0	0	Adaptation paradox - ok here, but remove inverted commas to avoid giving weight to this new terminology. (Rissik, David, Griffith University)
618	14	18	32	18	33	Risks are primarily locally generated - there are factors at the national and regional levels that determine vulnerabilities (Street, Roger B, Oxford University)
619	14	18	32	33	0	factors that make locals vulnerable are not always locally generated. Oftentimes they come from outside the local arena - national and global (Cheong, So-Min, University of Kansas)
620	14	18	46	0	51	I found these sentences confusing. While it is true that vulnerable groups do not (often, or always) "have access to the climate impacts science necessary to fulfill the requirements of top-down impacts-based assessments," it is not at all clear that they always need to, at least not in the form of climate scenarios. (UNITED STATES OF AMERICA)
621	14	18	48	18	49	In addition to what is said here, could note that some places also may not have accurate quantified information on historic weather and related impacts. (UNITED STATES OF AMERICA)
622	14	18	53	0	0	This assertion about assessments should be made more qualified. The word "general" should be replaced with "increased". After decision makers add ", in particular where they have been undertaken" (Rissik, David, Griffith University)
623	14	18	53	19	3	It is written here that awareness is often not translated into implementation or adaptation measures, which is often the case. However, in the paragraph as a solution to the problem, more tailored information is suggested. This to me will not solve the basic problem of how to create behaviour changes and how to get real changes happening. All in all, institutional, systemic and behaviour changes are not discussed in the chapter, at least in any depth. Maybe this is a new area in adaptation research and therefore not treated in more length, but certainly an issue which would require much more attention. (Kankaanpää, Susanna, Helsinki Region Environmental Services Authority (HSY))
624	14	18	53	19	6	fully agree with the implied 'decision-making focus' and maybe draw out here (and/ or elsewhere in the chapter) the several links to Chapter 2?). (Webb, Bob, Australian National University)
625	14	19	2	0	0	Adaptation bottleneck - use of this phrase is ok here, but please remove inverted commas to avoid giving weight to this new terminology. Just say that there is a bottle neck in adaptation (plainer english). (Rissik, David, Griffith University)
626	14	19	9	0	0	Section 14.5.4. National Assessments. A short introductory paragraph, or at least sentence, describing why this section is included would be useful. (CANADA)
627	14	19	9	0	0	Section 14.5.4: The issues raised in section 14.5.4 highlight the need for more skilled individuals in countries which underscores the need for more training programs. (UNITED STATES OF AMERICA)
628	14	19	9	19	9	Please clarify which Convention. (CANADA)
629	14	19	9	19	9	Is there any evidence of the value of national assessments in terms of information and promoting adaptation (or relative to identified objectives). Are there lessons learned by those countries that have undertaken national assessments (including multiple national assessments) and evidence as to how this information has been used to improve the assessments. (Street, Roger B, Oxford University)
630	14	19	9	19	35	Need some examples of good or emerging practice. This section is currently too rooted in the international architecture (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)

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631	14	19	11	19	11	Which "Convention" is being referred to here? (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
632	14	19	14	19	15	Suggest including a description of the UNEP Handbook. (CANADA)
633	14	19	16	19	16	Some countries are on the third or fourth National Communication. (Ebi, Kristie, ClimAdapt, LLC)
634	14	19	29	19	35	The paragraph misses some significant aspects of the UNFCCC NAP process. The following information should be included: "The objectives of NAPs are to reduce vulnerabilities, build adaptive capacities and resilience as well as to facilitate the integration of climate change adaptation into relevant new and existing policies, programmes and activities, in particular development planning processes and strategies, within all relevant sectors and at different levels, as appropriate (UNFCCC decision 5/CP.17). The national adaptation plan process should build on and complement existing adaptation planning, should not be prescriptive and should facilitate country-driven, gender-sensitive, participatory action, taking into consideration vulnerable groups, communities and ecosystems (UNFCCC decision 12/CP.18)." Furthermore, a reference to the recent NAP Technical Guidelines (LDC Expert Group, 2013) should be included in the document. (GERMANY)
635	14	19	29	19	35	Incorporate example of UK government first Climate Change Risk Assessment: http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=15747#RelatedDocuments (Rissik, David, Griffith University)
636	14	19	38	20	18	Avoid the confusion between metrics and indicators. Use only 'indicators' (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
637	14	19	38	24	6	Excellent discussion on metrics (Alcamo, Joseph, UNEP)
638	14	19	40	19	41	Check the grammar (Street, Roger B, Oxford University)
639	14	19	45	0	0	an assessment should give rather "review" than "explore" (Hanger, Susanne, International Institute for Applied Systems Analysis)
640	14	19	48	0	0	what alternatives? (Hanger, Susanne, International Institute for Applied Systems Analysis)
641	14	19	51	0	0	Section 14.6: further examples of criteria that could be used to measure successful adaptation could be linked to coherence i.e. with EU or national policies and or strategies, with local policies, etc. (ITALY)
642	14	20	2	20	4	Is there value in qualitative metrics? May be worth including some text on this (Street, Roger B, Oxford University)
643	14	20	6	20	18	Three uses of measurements, then 6, then second use , then third use. Review this paragraph for improved clarity of what categories are being talked about. Where does Hinkler fit? (Rissik, David, Griffith University)
644	14	20	6	20	18	Shouldn't these three uses of metrics be broken down into different sections? The principle behind each use is very different, and bundling them together in one paragraph implies more similarity than I would say is accurate. Each of them could probably cover a section on what needs to be measured, what metrics are established, and validation of metrics. (UNITED STATES OF AMERICA)
645	14	20	6	20	18	this paragraph lacks references (Hanger, Susanne, International Institute for Applied Systems Analysis)
646	14	20	6	20	18	Recognise the links between thiese as effective of adaptation also needs to identify when implemented measures are no longer sufficient or are contributing to maladaptation. (Street, Roger B, Oxford University)
647	14	20	17	20	17	Insert text, behind "...adaptation": "For example, Michaelowa et al. (2012) propose two generic adaptation effectiveness metrics: 1) wealth saved from destruction through climate change impacts, and 2) disability-adjusted life years saved (DALYs), which are widely used in public health policy analysis." The full reference is: Michaelowa, A.; Köhler, M.; Butzengeiger-Geyer, S. (2012): Market mechanisms for adaptation - an aberration or a key source of finance?, in: Michaelowa, A. (ed.): Carbon markets or climate finance?, Routledge, Abingdon, p. 188-208 (Michaelowa, Axel, University of Zurich)

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648	14	20	17	20	18	taking time to become identifiable - relative to initial and evolving objectives and conditions (Street, Roger B, Oxford University)
649	14	20	21	21	20	Very quantitative approach. Drivers could be measured by more qualitative measures (e.g. skills, culture, conflict). Many of these are vulnerability and resilience measures. Need to link to values - these change over time. Additional ref to consider: Benjamin L. Preston & Richard M. Westaway & Emma J. Yuen 2011 Climate adaptation planning in practice: an evaluation of adaptation plans from three developed nations Mitig Adapt Strateg Glob Change (2011) 16:407–438 (Rissik, David, Griffith University)
650	14	20	21	24	6	Metrics ignores species, habitat and ecosystem metrics work. Suggest additional references be considered: Bellard, C., Bertelsmeier, C., Leadley, P., Thuiller, W. & Courchamp, F. 2012 Impacts of climate change on the future of biodiversity. Ecology Letters, doi: 10.1111/j.1461-0248.2011.01736.x. Gerrodette, T., Olson, R. J., Reilly, S., Watters, G. & Perrin, W. 2012 Ecological Metrics of Biomass Removed by Three Methods of Purse-Seine Fishing for Tunas in the Eastern Tropical Pacific Ocean. Conservation Biology 26, 248-256. Link, J. S., Brodziak, J. K. T., Edwards, S. F., Overholtz, W. J., Mountain, D., Jossi, J. W., Smith, T. D. & Fogarty, M. J. 2002 Marine ecosystem assessment in a fisheries management context. Canadian Journal of Fisheries and Aquatic Sciences 59, 1429-1440. Rochet, M.-J., Trenkel, V. M., Carpentier, A., Coppin, F., Sola, L. G. d., Leaute, J.-P., Mahe, J.-C., Maiorano, P., Mannini, A., Murenu, M., Piet, G., Politou, C.-Y., Reale, B., Spedicato, M.-T., Tserpes, G. & Bertrand, J. A. 2010 Do changes in environmental and fishing pressures impact marine communities? An empirical assessment. Journal of Applied Ecology 47, 741-750. (Rissik, David, Griffith University)
651	14	20	23	20	25	In AR5 vulnerability and exposure are separately identified. Perhaps that can be mentioned here. (Chatterjee, Monalisa, IPCC WGII TSU)
652	14	20	24	20	25	This definition of vulnerability is not consistent with the glossary. (Ebi, Kristie, ClimAdapt, LLC)
653	14	20	44	0	0	Resilience section to consider: Davoudi et al, special edition, Planning theory and practice (2012). Available at: iaiaconnect.iaia.org/resources2/view/download/id/21585 (Rissik, David, Griffith University)
654	14	20	44	20	44	The sentence begins with, "It has been suggested..." and should state suggested by whom? (Rosales, Jon, St. Lawrence University)
655	14	20	44	20	45	Please reference who has suggested that a resilience framework is more appropriate and to which framework the authors are referring to. (CANADA)
656	14	20	44	20	52	This is the first mention of resilience in this chapter. This paragraph requires more references to help define the concept of resilience that is being referred to. (CANADA)
657	14	20	44	20	53	I am not convinced by the argument. Other scholars tend to think that resilience and vulnerability approaches lead to different view on adaptation progress and cannot be substituted Eakin, H., E. L. Tompkins, D. R. Nelson, and J. M. Anderies. 2009. Hidden costs and disparate uncertainties: trade-offs involved in approaches to climate policy.in W. N. Adger, I. Lorenzoni, and K. O'Brien, editors. Adapting to Climate Change: Thresholds, Values, Governance. Cambridge University Press, New-York. (Dupuis, Johann, Swiss Graduate School of Public Administration (IDHEAP))
658	14	20	49	0	51	need to revise grammar revision (VIETNAM)
659	14	20	49	20	51	Please reference this sentence as the authors suggest there is evidence ('proven') that the resilience framework referred to has been difficult to apply in practice. Could the same not be said about vulnerability assessment frameworks given the authors mention that little progress has been made on implementing adaptation options identified through adaptation assessments (page 3, lines 5-15; section 14.5.3)? (CANADA)
660	14	21	1	21	4	A conceptual diagram will be useful here. (Chatterjee, Monalisa, IPCC WGII TSU)

#	Ch	From Page	From Line	To Page	To Line	Comment
661	14	21	18	0	20	The authors do not make it clear that the theoretical construct must clearly be defined first. This table is taken directly from the paper by Perch-Nielsen without modification. The author states on p585 "the set of criteria was applied as guidance and not as a requisite for the selection of the indicators." Suggest that this qualifying text needs to be include here in the chapter. Additional reference for this point is King, D. and MacGregor, C. 2000. "Using Social Indicators to Measure Community Vulnerability to Natural Hazards". Australian Journal of Emergency Management, vol 15, no3 p52-57. The implication of page 21 lines 15-20 is that if the indicators fit the criteria they will be good. The theoretical framework implies selection of a construct but the preceding text does not make this clear as the fundamental basis of selecting indicators. Rather the text in these lines goes on about vulnerability instead of the core construct of climate change adaptation. (Rissik, David, Griffith University)
662	14	21	21	0	0	14.4.1.1. It is surprising not to see more on the important role of local government in land use planning. On this, and the importance of spatial planning in general, see Wilson, E. and J. Piper (2010). Spatial Planning and Climate Change. Routledge, and the reports that came out of the ESPACE Inter-reg project. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
663	14	21	22	21	23	Table 14.4: Above validity add another category of construct - criteria an adaptive action or behaviour; variable of measurable change (Rissik, David, Griffith University)
664	14	21	30	21	31	Perhaps the vulnerability estimate also covers under-community scales, such as individuals. A potential reference could be: Evans G W, Hubal E A C, Kyle A D, et al. Vulnerability as a function of individual and group resources in cumulative risk assessment. Environmental Health Perspectives, 2007, 115(5): 817. (NETHERLANDS)
665	14	21	35	21	44	The indices analyzed here are at least 10 years old, while the oldest is already 18 years. Science has progressed a lot since then and it should be easy to find newer examples. Source: e.g. http://weadapt.org/knowledge-base/vulnerability/sample-of-existing-vulnerability-indices (GERMANY)
666	14	22	1	0	0	Section 14.6.2.2: Rhe 2nd edition of the DARA Climate vulnerability monitor (http://daraint.org/climate-vulnerability-monitor/climate-vulnerability-monitor-2012/) should be included in this review. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
667	14	22	1	0	0	shouldn't this be Metrics for Resource Allocation to be in line with the next heading, otherwise this heading could be confusing. (Hanger, Susanne, International Institute for Applied Systems Analysis)
668	14	22	1	24	6	key findings from these sections should be added in the synthetic table of assessment types. (Chatterjee, Monalisa, IPCC WGII TSU)
669	14	22	9	22	9	Insert text, behind "...Wheeler 2011": "For allocation of scarce resources to adaptation projects, benefits of different options need to be evaluated and compared with the costs of implementing the options, leading to a ranking of options (Economics of Climate Adaptation Working Group 2009)". Full reference: Economics of Climate Adaptation Working Group (2009): Shaping climate resilient development. A framework for decisionmaking. A report of the Economics of Climate Adaptation Working Group. ClimateWorks Foundation, Global Environment Facility, European Commission, McKinsey & Company, The Rockefeller Foundation, Standard Chartered Bank and Swiss Re, San Francisco, Washington D.C., Brussels et al. (Michaelowa, Axel, University of Zurich)

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670	14	22	11	22	19	Using metric systems, country indexing and ranking, and comparative mechanisms is not be the best approach to support countries in their adaptation mechanisms. To support countries, building national modeling capacity in green jobs assessments, including the use of Dynamic Social Accounting Matrices (DySAM) "to better understand the impact of policies and programmes not only on employment, but also on the environment" would be important. The DySAM application and its multi-sectoral approach has been developed with "the purpose to compare the cost-effectiveness and employment dimension of different technologies applied in the implementation of infrastructure investment." (Jorge Alarcón, Christoph Ernst, Bazlul Khondker, PD Sharma, Dynamic Social Accounting Matrix (DySAM): Concept, Methodology and Simulation OUtcomes, ILO Employment Working Paper No. 88 - Geneva, International Labour Organization, 2011) (Harsdorff, Marek, ILO)
671	14	22	11	22	19	I do not see the purpose of this paragraph, I think this could be cut. (Hanger, Susanne, International Institute for Applied Systems Analysis)
672	14	22	29	22	31	Should you please provide more information to support this statement. (NETHERLANDS)
673	14	22	38	22	38	Add text:" Moench et al. (2009) discuss application of metrics for selected adaptation projects in South Asia." Full reference: Moench, M., Fajber, E., Dixit, A., Caspari, E. and Pokhrel, A., 2009. Catalyzing climate and disaster resilience. Processes for identifying tangible and economically robust strategies. Final Report of the Risk to Resilience Study. Institute for Social and Environmental Transition, Kathmandu (Michaelowa, Axel. University of Zurich)
674	14	22	41	0	0	Evaluation and monitoring can be used to define baselines for assessment of the effectiveness of adaptation options. (Ebi, Kristie, ClimAdapt, LLC)
675	14	22	44	22	47	One specific role of evaluation that appears to be missing from this is a requirement to ascertain if implemented measures are having the desired affect, are still sufficient, are in need of enhancement or are contributing to maladaptation. (Street, Roger B, Oxford University)
676	14	22	49	22	49	And multiple time frames. (Ebi, Kristie, ClimAdapt, LLC)
677	14	22	51	22	52	There are already adequate peer-reviewed references to be cited. Perhaps no need for IGES publication. (NETHERLANDS)
678	14	23	1	23	12	Section 14.6.2.3: process-based and outcome-based adaptation indicators could be described more in depth (i.e. objectives, approaches, examples). (ITALY)
679	14	23	21	0	0	New indicators, a comparison of existing indicators, and a new method to validate vulnerability indicators for drought can be found in: Alcamo, J., Klein, R., Carius, A., Acosta-Michlik, L., Krömker, D., Tänzler, D., Eierdanz, F. 2008. A new approach to quantifying and comparing vulnerability to drought. Regional Environmental Change 8:137–149. DOI 10.1007/s10113-008-0065-5. (Alcamo, Joseph, UNEP)

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680	14	23	29	23	43	An elaborate approach to validation is applied in a study on climate vulnerability and related adaptation of smallholders in southern Peru (Sietz et al. 2012). This study presents a typology of smallholder vulnerability and places emphasis on an outcome-based aspect of validation based in independently acquired information. It demonstrates the clear correlation between weather-related damages and the typology of smallholder vulnerability. In particular, the similarities among the households revealed by the typology hold true with regard to the outcomes of the climate exposure. These similarities prove that the typology provides specific information on the climate vulnerability of the smallholders investigated. The outcome-based aspect is complemented in a second step which tests the hypotheses used to define and indicate the underlying processes. This test shows that the vulnerability-creating mechanisms implied by the typology are consistent with reported processes that explain the household-specific damages caused by weather extremes. This elaborate form of validation was possible by concentrating on a specific exposure in a given region and placing the emphasis on a specific livelihood aspect. In addition, another study identifies patterns of vulnerability in drylands worldwide (Sietz et al. 2011). Working at the global level largely restricts an outcome-oriented validation due to spatial variations in stress exposure and limitations in independent observational data which are globally available, e.g. low spatial resolution and inconsistent methodologies. Therefore, this study uses independent case studies to validate pattern-specific mechanisms and their spatial distribution. Moreover case studies serve to prove the transferability of vulnerability-reducing approaches. --- References: Sietz, D., Lüdeke, MKB. and Walther, C. (2011) Categorisation of typical vulnerability patterns in global drylands. Global Environmental Change 21(2): 431-440. ; Sietz, D., Mamani Choque, SE. and Lüdeke, MKB. (2012) Typical patterns of smallholder vulnerability to weather extremes with regard to food security in the Peruvian Altiplano. Regional Environmental Change 12(3): 489 - 505. (sietz, diana, Wageningen University)
681	14	23	30	23	30	Reference needed for the CRED database plus a brief explanation of what it is. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
682	14	23	39	23	41	Delete the whole paragraph. It is not clear, why the source Perch-Nielsen (2010) is chosen; it remains open how exactly the indicators were generated and how the robustness analysis was executed. why Unfortunately I did not have access to the Perch-Nielsen article, but in my understanding, her approach is nothing special but the regular procedure, every sound scientific analysis should use - use a systematic approach (what does that mean? Every research should use some kind of systematic approach), establishing framework and from that framework derive the indicators. And it remains open how exactly the indicators were generated. The robustness analysis however, sounds rather interesting, but unfortunately we do not learn more about that. (GERMANY)
683	14	23	45	0	0	14.4.2.1. Not clear why district government is mentioned here separately from local government, discussed previously in 14.4.1.1. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
684	14	23	51	23	53	Should not also researchers be working with those requiring the metrics (co-generation, co-production and co-dissemination) to identify, develop and select the required metrics? Researchers working in isolation to develop such metrics may not be an effective approach (Street, Roger B, Oxford University)
685	14	24	0	26	0	comment on part 14.7: should add somewhere : based on the experience how to avoid maladaptation and adaptation deficit. (VIETNAM)
686	14	24	9	0	0	Authors should connect the discussion in this section with relevant sections in chapter 9, 13, 19. (Chatterjee, Monalisa, IPCC WGII TSU)

#	Ch	From Page	From Line	To Page	To Line	Comment
687	14	24	9	24	9	Measures implemented may be initially appropriate adaptation, but as pressures change and new knowledge and experience is included, those measures may no longer be 'appropriate' and could be construed as maladaptive. Failure to take action based on evidence from M&E could be defined as maladaptive behaviour (Street, Roger B, Oxford University)
688	14	24	11	24	15	Later text (e.g. page 25, lines 4-5) talks about adverse adaptation activities, but this intro sentence seems to skip this possibility entirely. (UNITED STATES OF AMERICA)
689	14	24	11	24	27	Discuss the different timescales relevant for definition of maladaptation. Is anything maladaptation that is not resilient for the next 1000 years? Probably not. Relevant timescales are probably the lifetime of assets eventually jeopardized. Probably, benefits accruing due to the initially successful adaptation need to be compared with the impacts occurring later. Shouldn't maladaptation be limited to those cases where the impacts are higher than the benefits? (Michaelowa, Axel, University of Zurich)
690	14	24	12	24	14	A citation to the definition of maladaptation is necessary. Hendry A P and Gonzalez A (2008. Whither adaptation? Biology & Philosophy, 23(5): 673-699) argued that there 'are a strong and a weak definition of maladaptation. In the strong sense, maladaptation is present if the population cannot sustain a positive growth rate in the long term. In the weak sense, maladaptation is present if phenotypes do not maximize local fitness, compared to other relevant phenotypes.' (NETHERLANDS)
691	14	24	12	24	14	Or have impacts on other sectors (such as water affecting agriculture affecting health). (Ebi, Kristie, ClimAdapt, LLC)
692	14	24	14	24	15	Sentence has a problem. "The construction of well engineering of roads...." does not make sense (WOODS, Paul, World Vision)
693	14	24	29	24	37	The inclusion of the terminology of "manipulation" introduced by Thomsen et al (2012) in the section on maladaptation is misplaced, as is the description of beach renourishment as maladaptive because it is a manipulation of the system. The inclusion of this information suggests that manipulation is simply another form of maladaptation. If this is so, then the entire structural/engineered adaptation category would be considered maladaptation, whether or not it provides social benefits. Suggest removing the paragraph at the end of line 27, and deleting everything until the last sentence in the following paragraph (lines 37-40). (UNITED STATES OF AMERICA)
694	14	24	43	0	0	Authors may wish to collect examples from the report in a box in this section. (Chatterjee, Monalisa, IPCC WGII TSU)
695	14	24	45	24	49	Could these short-term actions, although in the broader perspective be seen as maladaptive, actually be necessary as part of an overall adaptation strategy. These actions may be seen as transitional adaptation measures necessary to provide time and space to introduce transformational adaptation that for a number of reasons cannot be introduced immediately. (Street, Roger B, Oxford University)
696	14	24	45	24	53	The structure of the sentence starting with "One is development policies" should be reexamined. Readers may misunderstand that the construction of 'hard' infrastructure always leads to greater vulnerability in the medium to long-term. It is obvious that the construction of large dikes in Netherland should not be a case of maladaptation. Society as a whole, not researchers only, should decide on the proper 'adaptation' measures. (Mochizuki, Tsuneyoshi, Japan River Association)
697	14	25	4	25	10	I would have expected to see information and literature cited on interdependencies within this paragraph or subsection. (Street, Roger B, Oxford University)
698	14	25	9	25	10	I think it is not suitable to take the conversion of coastal mangroves into shrimp farm in the section of "cause of maladaptation" since this is not an adaptation action or measure. Therefore, it should be deleted. (wang, chunfeng, State Forestry Administration, China)

#	Ch	From Page	From Line	To Page	To Line	Comment
699	14	25	10	0	0	Please add the following text at the end of this paragraph: "Maladaptation may also occur if the true potentials of an option or a technology is unduly over-emphasized making it over-rated. Floating gardening is an interesting example in this connection (Irfanullah, 2009; Irfanullah, 2013)." References: [1] Irfanullah, H.Md. 2009. Floating gardening in Bangladesh: Already affected by climate variability? In: IUCN, UNEP, UNU. Biodiversity conservation and response to climate variability at community level. IUCN, UNEP, UNU, Dhaka, Bangladesh, 7-14 pp. [2] Irfanullah, H.Md. 2013. Floating Gardening: A local lad becoming a climate celebrity? Clean Slate 88: 26. (Irfanullah Haseeb Practical Action)
700	14	25	15	25	19	Correction: The text incorrectly claims that the first dimension of maladaptation noted, "(i) increased emissions of greenhouse gases", "assumes a fungibility between mitigation and vulnerability". Adaptation measures that significantly increase greenhouse gas emissions contribute to further climate change and so potentially to further climate change impacts, and that if this form of positive feedback is large enough, or taken up on a large enough scale, it could be considered as a maladaptation. This is different from mitigation and vulnerability being fungible or mutually substitutable. The reason for this subjectivity is judgement as to when potential greenhouse gas emissions from an adaptation are sufficiently large or taken up on a large enough scale to be considered maladaptive. A relevant quote from Barnett and O'Neill (2010) paper cited: "the problem with energy-intensive adaptation actions is that while they may address current needs, they create a positive feedback by increasing emissions of greenhouse gases, thereby increasing the likelihood that further adaptation to climate change will be required in the future." (AUSTRALIA)
701	14	25	16	25	20	Here are studies dealing with the disproportionate effect the megacities have on the atmosphere and human health. They use advanced monitoring techniques and a set of indicators to avoid being subjective or not interpreted. See: 1. Guttikunda S K, Tang Y, Carmichael G R, et al. Impacts of Asian megacity emissions on regional air quality during spring 2001. Journal of Geophysical Research, 2005, 110: D20301; 2. Butler T M, Lawrence M G. The influence of megacities on global atmospheric chemistry: a modelling study. Environmental Chemistry 2009 6: 219-225 (NETHERLANDS)
702	14	25	19	0	0	Incorrect use of the word fungibility. Incorrect assumption about assumption of paper: assumes adaptation measure which increase greenhouse gas emissions and therefore more climate change and therefore maladaptive. Mitigation in the sense of greenhouse gas emissions? JD (Rissik, David, Griffith University)
703	14	25	22	25	23	Section 14.7.2 refers to potential maladaptation as forecast in a study by Barnett & O'Neill published in 2010. As many of the aspects of the forecast are no longer accurate, suggest a different example of potential maladaptation could be provided, or the text could be updated to explain: (i) the Victorian desalination plant will be powered by renewable energy (refer: www.aquasure.com.au/plantdescription.php); (ii) decisions about the volume of desalinated water will undertaken according to total water availability and demand, e.g. as water storages are currently at reasonably high levels, the Victorian government has not placed an order for desalinated water for the 2013-14 financial year (refer: http://www.peterwalsh.org.au/_blog/Media_Releases/post/Good_storages_result_in_OGL_desalinated_water_order/); (iii) Government commitments to integrated water management in Victoria support the use of a range of water sources including rainwater, stormwater and wastewater, with aim of decreasing the demand on potable water supplies and the need for new infrastructure (as outlined in Box 25-2 in Chapter 25); and (iv) rather than the desalination plant reducing the incentives to adapt through water conservation approaches, managing water demand remains an important part of the whole water management task in Melbourne, which was recently demonstrated when the low-level temporary water restrictions were adopted as a 'permanent water saving rules' (http://www.water.vic.gov.au/saving/restrictions). (AUSTRALIA)
704	14	25	30	0	0	An example will be very useful. (Chatterjee, Monalisa, IPCC WGII TSU)
705	14	26	1	0	0	It would be helpful to also discuss residual damages. (Ebi, Kristie, ClimAdapt, LLC)

#	Ch	From Page	From Line	To Page	To Line	Comment
706	14	26	1	0	0	The chapter has very little on adaptation deficit and this discussion is completely disconnected with the rest of the chapter. It should be integrated in the needs and options discussion and appear earlier in the chapter. (Chatterjee, Monalisa, IPCC WGII TSU)
707	14	26	1	26	11	An adaptation deficit may also be the result of incomplete adaptation. There may not be sufficient capacity (or resources) to implement the required adaptation and as a preliminary step measures are strategically introduced as a step towards adaptation (e.g., measures introduced to build awareness, community and capacity). This approach is a legitimate and probably realistic strategy, but will leave a deficit that will need to be addressed (Street, Roger B, Oxford University)
708	14	26	3	26	4	Where the glossary definition is provided here, the glossary for the report could be explicitly referenced parenthetically. (Mach, Katharine, IPCC WGII TSU)
709	14	26	6	26	6	The cross-reference to relevant material in a section of Chapter 17 should be completed. (Mach, Katharine, IPCC WGII TSU)
710	14	26	11	0	0	There is also an adaptation deficit if adaptation measures to accommodate current climate conditions limit the ability to adapt to future climate conditions. The increased intensity, frequency, and duration of extreme events, as climate change becomes more extensive, means that adaptation based only on recent experience or extrapolation of historical trends could be largely ineffective. [15.3.2.2] (Backus, George, Sandia National Laboratories)
711	14	26	19	26	19	FAQs should cover more aspects of the chapter than at present (Hay, John, University of the South Pacific)
712	14	26	21	0	0	FAQs need to be jargon free and should not focus on definitions but showcase important take away points from the assessment. For example, an interesting question for the wider audience would be on challenges in identifying maladaptive policies, or the difference between needs and adaptation deficit. (Chatterjee, Monalisa, IPCC WGII TSU)
713	14	26	21	26	21	"... and are the differences important?" (Hay, John, University of the South Pacific)
714	14	26	22	26	24	I suggest to avoid any judgement about which definitions are used more commonly than others. There is an impressive level of confusion between different communities of researchers and practitioners. And within these camps the real understanding of the different definitions also varies markedly. (Harnisch, Jochen, KfW)
715	14	26	29	0	0	Please remove the word "concrete" and replace here with "specific and measurable." (UNITED STATES OF AMERICA)
716	14	26	32	26	34	It will achieve adaptation outcomes, but whose outcomes? Also need to look at this development in the broader context - system dependencies and interdependencies may actually mean that the measures introduced could be maladaptive. (Street, Roger B, Oxford University)
717	14	26	38	26	40	Following the sentence, "Some definitions of success emphasize reducing risks to a predetermined level while other focus on achieving predetermined levels of social and or economic well being." - add - "The ILO defines Adaptation as "reducing the vulnerability of workers, enterprises and governments to the effect of climate change and enhance capacity at individual and society level to adapt, respond to and prepare for climate change" putting the focus specifically on the vulnerable and enhancing their capacity to adapt. (M. Harsdorff, M. Lieuw-Kie Song; K. Philip; M. Tsukamoto. Towards an ILO approach to Climate Change Adaptation, ILO Employment Working Paper No. 104 - Geneva, International Labour Organization, 2011) (Harsdorff, Marek, ILO)
718	14	26	41	26	44	This definition for the AR5 is an excellent one. Let's hope it gains wide acceptance. (Harnisch, Jochen, KfW)
719	14	32	50	0	0	14.7.1. If the concept has not been defined at more length until this point (and I would recommend that it should be), a more comprehensive discussion should be included here. The 5 dimensions identified by Barnett and Adger are only briefly listed. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
720	14	33	6	0	0	"....2011a...." will be "....2008...." (Irfanullah, Haseeb, Practical Action)
721	14	33	9	0	0	"Infranullah....." will be "Irfanullah....." (Irfanullah, Haseeb, Practical Action)

#	Ch	From Page	From Line	To Page	To Line	Comment
722	14	33	9	0	0	"....2011b...." will be "....2011...." (Irfanullah, Haseeb, Practical Action)
723	14	34	19	0	0	14.7.3. There should be some discussion of the potential for impact assessment instruments including EIA and SEA. Some have suggested that in order to avoid maladaptation, those conducting EIA and SEA should include a 'worst case' climate scenario to draw it to the attention of decision makers. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
724	14	40	0	0	0	Table 14.1 - In the 'institutional' category cites "a lack of informal norms, to promote and support adaptation." This should say explicitly that (voluntary) norms/standards are needed for improvement of the robustness and resilience of the built environment. (Wright, Richard, Retired, U.S. National Institute of Standards and Technology)
725	14	40	0	0	0	Table 14.2 – cites building standards in the category "Institutional, Laws and Regulations." This overlooks the voluntary nature of standards that can guide voluntary or contractual adaptation decisions, as well as being used or referenced in regulations. (Wright, Richard, Retired, U.S. National Institute of Standards and Technology)
726	14	40	0	0	0	Table 14.2 – cites building standards in the category "Institutional, Laws and Regulations." This overlooks the voluntary nature of standards that can guide voluntary or contractual adaptation decisions, as well as being used or referenced in regulations. (Wright, Richard, Retired, U.S. National Institute of Standards and Technology)
727	14	40	0	0	0	Table 14-1 as mentioned in earlier comment would benefit from more clarity on the concept of needs vis a vis actual vulnerabilities and enablers/ barriers/challenges to actual adaptation (Webb, Bob, Australian National University)
728	14	40	0	0	0	Table 14-2. Category Behavioral is in the table under Social. However, to get institutional and systemisc changes, behavioural changes are necessary. Also here the examples of behavioural options are partly quite technical in nature, for example storm drain clearance can be considered part of normal maintenace work of drainage systems that does not require fundamental changes in behavior. Also evacuation planning and water conservation measures are at least in Finland part of regular work of the organisations responsible for these issues. Also, plans and programmes are listed as institutional adaptation options. Naturally plans are an important step in the process of adaptation, but they alone do not guarantee that any adaptation really happens. Rather one would need to list examples of policies and measures here. (Kankaanpää, Susanna, Helsinki Region Environmental Services Authority (HSY))
729	14	40	0	0	0	The example of ecosystem based adaptation referred to in the text should be included in table14-2. Also, the examples in the table should be explained in the text. The tables in SPM and TS should be consistent with the revised version. (JAPAN)
730	14	40	0	0	0	Table 14-1: Does it really mean to say "increasing the vulnerabilities of peoples who depend on these ecosystems services? Seems reversed - (UNITED STATES OF AMERICA)
731	14	40	0	0	0	Table 14-2: missing urban heat island effect remove the word "home" and use building enclosure insulation/sealing/shading services - add localized production of goods It would be helpful to separate the prevention to shocks efforts from the preparedness/response/recovery efforts (UNITED STATES OF AMERICA)
732	14	40	0	0	0	Table 14-2: Not all ecosystem-based adaptation approaches are "structural." Under ecosystem-based, may want to add "Shade tree planting" as another example. Would also recommend saying "Wetland and floodplain conservation and restoration" instead of "Wetland re-establishment; Re-establish floodplains." Many readers wouldn't know that "fuel" means trees/plants so may want to use another phrase to communicate this point on fire management. (UNITED STATES OF AMERICA)
733	14	40	0	0	0	Table 14-3: Recommend adding "Avoiding maladaptation." (UNITED STATES OF AMERICA)
734	14	40	0	0	0	Table 14-1 Examples of needs in the first row is all about the role of government and formal agencies, informal institutions have to be added. (Chatterjee, Monalisa, IPCC WGII TSU)
735	14	40	0	0	0	Table 14-1. In the biophysical and environmental entry in this table, it would be helpful to clarify what is meant by "addressing increasing the vulnerabilities." (Mach, Katharine, IPCC WGII TSU)

#	Ch	From Page	From Line	To Page	To Line	Comment
736	14	40	0	0	0	Table 14-2. The chapter team could consider expanding this table to include a variety of entry points, with cross-references to other chapters, as done in the summary for policymakers. (Mach, Katharine, IPCC WGII TSU)
737	14	40	0	0	0	Table 14.1 Under Resource - ...required for planning, implementing and evaluating adaptation (Street, Roger B, Oxford University)
738	14	40	0	0	0	Table 14.2 Under Government Policies and Programmes - should be adaptation planning, including monitoring and evaluation (Street, Roger B, Oxford University)
739	14	40	1	0	0	Table 14.1. In this table, problems are listed, not adaptation needs. For example, category "Institutional", one problem is inadequate laws. What is needed is improved legislation. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
740	14	41	0	0	0	Table 14-3: Add "Reduce vulnerability" and "Increase resilience" (UNITED STATES OF AMERICA)
741	14	41	0	0	0	Table 14-3: Add or designate time and spatial scale which cause this list to vary greatly in the choices developed and decisions made (UNITED STATES OF AMERICA)
742	14	41	0	0	0	Table 14-4: Add lines to separate for reading clarity (UNITED STATES OF AMERICA)
743	14	41	0	0	0	Table 14-4: The explanation for "high Information Content" appears to preclude the use of projected changes in climate. How about instead listing this explanation: "continuous vs. categorical variables, credible synthesized projections." (UNITED STATES OF AMERICA)
744	14	41	0	0	0	Table 14-3: further examples of considerations that could be made when selecting adaptation options could be useful: i.e. acceptability (from a cultural, social, political point of view), urgency, sustainability, side-effects, feasibility, coherence, etc. (ITALY)
745	14	41	0	0	0	Table 14.3 should also include acceptability and sustainability as considerations (Street, Roger B, Oxford University)
746	14	42	0	0	0	Figure 14-1 is not really providing much. Perhaps it should be dropped. (Chatterjee, Monalisa, IPCC WGII TSU)
747	14	42	0	0	0	Figure 14-2 Authors may wish to expand on this to incorporate AR5 framing of key concepts. (Chatterjee, Monalisa, IPCC WGII TSU)
748	14	42	0	0	0	Figure 14-1: The author team should include a sentence in the figure caption explaining the main message of this figure. (Estrada, Yuka, IPCC WGII TSU)
749	14	42	0	0	0	Figure 14-2: The author team should include a sentence in the figure caption explaining the main message of this figure. If there is significance to the different color lines/arrows, this should be stated. What is the significance of the multiple overlying boxes in 3,4 and 5? (Estrada, Yuka, IPCC WGII TSU)
750	14	42	0	0	0	Figure 14.1 Under business continuity should also include working in concert as part of a business community. Under Business as a Stakeholder - is reacting sufficient? I would suggest not and expect that there is a need for a more proactive approach (leading and promoting/driving for change) (Street, Roger B, Oxford University)
751	14	42	1	42	0	Figure 4-2 is similar to Figure 2-2 (Chapter 2), but includes more feedback loops and more correctly underlines the iterative process of vulnerability and options' assessment. It would be beneficial to use one uniform approach to describe the decision-making process. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)