



**IPCC WGII
Fourth Assessment Report
Climate Change Impacts, Adaptation and Vulnerability
*Government and Expert Review of Second Order Draft***

Specific Comments

EXPERT REVIEW COMMENTS

Chapter 7

August 2006

Organization of the review comments file

Comments are organized as follows:

- (a) First are the comments from the Co-Chairs and TSU. These:
 - (i) track the development of the ZOD and FOD, and your responses to review comments on each of these drafts, and then
 - (ii) present comments on the Second-Order Draft
- (b) Second are the comments from the Expert Reviewers, organized in the same format as your FOD comments file.

**Government and Expert Review of Second Order Draft
Confidential, Do Not Cite or Quote
August 2006**

Discussion of expert review comments and record keeping

IT IS RECOMMENDED THAT:

- AUTHORS BEGIN WORK ON THE COMMENTS IMMEDIATELY. SUBSTANTIVE COMMENTS NEED TO BE SEPARATED FROM NON-SUBSTANTIVE, AND THE TWO SHOULD BE TREATED DIFFERENTLY
- CONTACT IS MADE BETWEEN AUTHORS AND THEIR REVIEW EDITORS IN AUGUST

Substantive comments

- The chapter writing team should discuss all substantive expert review comments, by email and/or at Cape Town.
- Substantive comments require full and proper consideration. The *Principles Governing IPCC Work* state that:
 - genuine controversies should be reflected adequately in the text of the Report and
 - it is the role of the Review Editors to advise the lead authors on how to handle contentious/controversial issues
- You must record the outcome of these discussions in this document, under the column 'Notes of the Writing Team'.

Non-substantive comments

- For non-substantive comments, a very brief entry should be made in the column 'Notes of the Writing Team'. The following terms are acceptable:
 - Addressed
 - Not applicable
 - Text removed
 - A tick to denote a comment has been addressed (somewhere on the document this should be stated)

General

- The record should be kept in this document, ideally electronically.
- The document becomes part of the traceable account of the Working Group II Fourth Assessment. When completed to the satisfaction of the Review Editors, a copy should be returned to the TSU by the **8th December 2006**.

Chapter 7

Comments from the Co-Chairs/TSU are laid out as follows: first we comment on whether the SOD addresses the comments we made on the ZOD; second we comment on whether the SOD addresses the comments we made on the FOD; our concluding comments on the Second-Order Draft are at the end

	Chapter 7 ZOD comments by Co-Chairs and TSU	Has this been addressed in the SOD?	Author responses:
7.Z	GENERAL COMMENTS		
7.Z1	The chapter is mostly tightly written and the first half flows well. The Chapter trails off towards the end, with several subsections short or to be completed. Except for a few long subsections (e.g. water supply), this chapter actually could be longer and more complete - much of it is far too general.	Much more substantial in the later sections; now complete and not too general. Weakest section is the Adaptation section, which tends towards being too general with the material becoming more appropriate for Chapter 17 – it needs to focus more on the sector of concern.	Adaptation section revised, with added focus subject to literature limitations.
7.Z2	In general, the chapter reads like a text book or long editorial with a preponderance of old citations and a lack of supporting evidence.	References now, with a few exceptions, properly up-to-date. Style much improved with a few exceptions principally 7.6.5 which still has very much a textbook style. Supporting evidence now supplied, but sometimes examples don't have references and this needs to be addressed in FGD.	Addressed where literatures are available.
7.Z3	Little new knowledge is shown in much of the text which: a. appears to replicate what was reported in SAR and TAR and b. is not much sourced with post 2000 references.	Most references now post-TAR. It isn't clear what is new since the TAR, and authors need to pay more attention to this.	Considered, but it is more important to tell a coherent story than to assume that a reader is intimately familiar with the TAR.
7.Z4	The Chapter should focus on the key new findings since TAR which either: a. confirm and extend TAR findings and deserves re-emphasizing, or b. revise TAR findings	See 7.Z3	Most sections are new since the TAR.
7.Z5	The authors should consider a significant up-dating of the issues in TAR Chapters 7 (Human Settlements, Energy and Industry) and 8 (Insurance and other Financial Services). Although these issues are mentioned under the comment on TAR, up-dating is necessary.	Authors don't make their baseline (i.e., TAR findings) clear so it's difficult to judge this.	See above.

7.Z6	The Insurance section does not seem to represent new knowledge (source by recent references) as compared with TAR (old work is especially prevalent in Section 7.5). All statements need sources. Much of the current text is already in the SAR and TAR. There are key areas in SAR and TAR, however, which need confirmation or revision, such as TAR Table 8.1 and Figure 8.4.	Some interesting material on insurance, with up-to-date references. Some of it gets too technical. TAR Table 8.1 is not updated but a table on impacts on all sectors of industry, settlement and society is included which is a good contribution. Fig. 8.4 is not up-dated.	Considered by the relevant LA.
7.Z7	As it is common with first drafts, the text is quite uncoordinated and references need to be added. Although it includes some cross-cuts with other chapters, a number of them are missing as they are the references to CCTs.	Text now tight and well-focussed. Some references still missing, especially examples, and some long stretches of text with no or few references, e.g., Section 7.4.2.1 The chapter has a large number of cross-references to other chapters, but some may be wishful thinking, and with one exception are to the chapter as a whole whereas it would be very helpful if authors could check (a) to make sure the material really is in the chapter and (b) to give a section in the chapter.	Did our best to cross-check.
7.Z8	The wording of the section headings in the outline should be followed. You have the correct sections but we would prefer consistent wording between Chapters.	Used exactly	Yes.
7.Z9	The IPCC Plenary requested coverage of livelihoods (including rural) and employment (see Document 4, page 31, Green Book, from LA1, Vienna). Please cover these.	Not covered	Livelihoods covered in the SOD, mentions of employment added.
7.Z10	Generally, you need to think about and prioritize your conclusions regarding what new information about impacts in your several fields (make sure you cover them all, even if to say the new information is limited), and substantiate these.	Industry, settlement and society are covered. The weakest of the three impact sections is Society, which is under the sub-heading Social Issues (7.4.2.5), only has 7 lines on settlements, nothing on employment, and is repetitive of earlier sections in describing 'greatest concerns'	Revised: note that "settlements" is a section separate from social issues.
7.Z11	The use of very specific acronyms and abbreviations may pose difficulties to AR4 readers.	Removed	Yes.
7.Z12	Every statement in the assessment should be supported by reference to sources. There is much text that is not.	Still true, but less of a problem.	See 7.Z2

7.Z13	LENGTH The ZOD is presented in 39 pages, 9 of which are references. However, as shown in a specific section/subsection analysis, the text has to be completed, adding an executive summary, many new sources and completing various parts.	On length within margins of error.(Target = 40; Actual = 41)	Still in the specified page range.
	SPECIFIC CONTENT		
7.Z14	The section on current sensitivity could report new knowledge from research on, for instance, impacts of recent extreme events on industry, etc., e.g. floods and the hot summer 2003, in Europe. In fact, there is no reference to the remarkable heat wave which affected Western Europe in 2003. This should be mentioned, at least with a cross-cut with Chapters 8 and 12.	Box is included on 2003 European heat wave; many references to Hurricane Katrina.	Yes.
7.Z15	The Chapter lacks of information on urban transport means (combustion and electrically driven vehicles, etc.) and the observable differences on the urban pollution sources and effects.	Has quite a lot to say about pollution. Doesn't explicitly refer to electrically-driven motors, but the authors might say that was for WG3.	Considered in 7.6, but mainly a WG III issue
7.Z16	The subsections should made clear the assumed mean climate change futures in your impact estimates and the time-scale of effects (2030, 2050, 2080, etc).	Don't do this, and say twice that it isn't possible.	It is not.
7.Z17	The reader will wish to know whether there is enough published science to assess effects under: i) stabilization scenarios ii) different SRES futures?	They say there isn't	There is not.
7.Z18	The section on assumptions might summarize as a table perhaps: population, income, urbanization, employment type assumptions in, e.g. SRES futures.	Not done.	Section revised considerably, subject ot length constraints.
7.Z19	Section 7.5 is especially thin.	Better, and interesting, but stresses lack of information	Doing our best with available information.
7.Z20	Geographical / country references should define the specific region / sub-region for which the effects of a given variable / phenomenon/process are referred (e.g. Chile is not all dry, with reduced precipitation rates, as it is mentioned in page 15, line 29.	Largely done	Done within the limits of available research.
7.Z21	Careful use of terminology is required (for example, hurricanes strictly only apply to the Caribbean and tropical cyclone is for example a better generic term.	Only uses 'hurricane' twice when 'tropical cyclone' would be preferable: page 8 line 2 and page 31 line 17.	The terminology issued in the literature is region-specific: in this particular region, "Hurricane" is part of the event label.

7.Z22	When Section 7.8 is developed, reference could be made to bio-geophysical and socio-economic information, better to assess vulnerabilities, define costs and develop adaptation strategies, and better to inform knowledge gaps and research strategies.	Now developed, and well-written. Doesn't deal with bio-physical information.	Given limited space, focused on topics of highest priority for human systems.
	Chapter 7 FOD comments by Co-Chairs and TSU	Has this been addressed in the SOD?	Author responses:
	Comments: Osvaldo Canziani		
7.F1	As is known, one of the prerequisites to make IPCC reports, and in particular its conclusions, readily understandable to users / decision makers, is to present the texts in a clear, straightforward language, understandable and easy for translation, at least in the UN languages. This FOD version does not fulfill this requirement. Its long sentences and too technical wording should be reviewed. The ES is skewed in favor of economic issues and, in spite of the multi-factors involved, the mutual interactions between urban and rural areas, it misses appropriate reference to the human component. Reading the ES it appears that the references on poverty and indigence /pauperism, quite outstanding issues in the context of urban/rural settlements / societal relations in practically all the world 's regions, are minor.	Generally written at an appropriate level for the audience. One exception is 7.6.6 ES now has long section on vulnerability, and has something to say about poverty	Yes, and further material added.
7.F2	I observe the repetition of complete sets of paragraphs, in different segments of the FOD. These will be mentioned in the specific comments. Further, since many references are taken from studies made from the point of view of developed countries, and so quoted, the advice to be provided to developing countries is lost or incomplete.	No repetition. Still strongly biased towards developed countries	Continued efforts to add developing country material where literatures are available.

7.F3	<p>There is no full discussion of the effects of industrial wastes and commercial leftovers on the environment and hence, in spite of making some references to Chapter 8 - Human Health, some information on their impacts on human, animal and plants, with the inevitable increased vulnerability of urban drainage and sewage systems, leading to flood-prone conditions and to air, water and soil pollution, are not mentioned nor cross-referred to other WG II chapters.(Ref. Urban Stormwater Management Planning (Adams B.J. and F. Papa, John.Wiley & Sons, Inc, 2000). Despite the increasing vulnerability of urban people to the environmental scourges enhanced by shanty towns / slums / favela developments, etc, no reference is made to the study undertaken by the WHO Commission on Health and Environment – Report of the Panel on Urbanization (1992), regarding their adverse effects on urbanites (health, security, etc). Better cross referencing with chapter 8 is necessary.</p>	<p>There is quite a lot on pollution, water and air, but nothing explicit about industrial waste.</p> <p>WHO Commission is not cited.</p> <p>Cross-referencing now good.</p>	<p>No literatures on industrial waste as a climate impact issue.</p>
7.F4	<p>Finally, although the concept of globalization is applicable, authors should know that the huge income differences, which are reported in the ratio 40 : 1 are much more than that in large cities in developing countries, reaching the ratio 140 to 1. Developing countries show something more than 40 % of their population under the poverty line, and more than 20 % below the pauperism's situation.</p>	<p>Some discussion of poverty – Section 7.4.2.5. No numbers given on inequities in income distribution.</p>	<p>Considered to the limits of available literatures on climate change impacts.</p>
	<p>Comments: Martin Parry</p>		
7.F5	<p>Section 7 title should be "Conclusions: implications for sustainable development"</p>	<p>Used</p>	<p>Yes.</p>
7.F6	<p>Can section 7 follow successful example of ch 4 in summarising its assessment, thus develop: a) table summarising impacts by increments of T change (table 4.5); b) a summary of projected impacts worldwide (figure 4.9); and c) a burning embers diagram for each subsector to show key vulnerabilities (fig. 4.10)</p> <p>It is not clear what messages in the ES and concluding sections are NEW or are re-affirmations of those in TAR. Please make this clear.</p>	<p>(a), (b) and (c) not done; still not clear what is new since TAR.</p>	<p>See comments above. New C/D/N notation is helpful.</p>
7.F7	<p>Some boxes are thin</p>	<p>Boxes are much better. Box on Environmental Migration might be better off</p>	<p>Considered.</p>

		in main text.	
7.F8	Not all factual statements are referenced, but they should be.	Still true	See above.
7.F9	Length: text is 50 pp Word (32 pp printed) and refs 10pp Word (5 pp printed). Total is thus 37 pp and needs reducing by 7 pp. In general the text is more discursive and less dense than in other chapters (which, for example, have extensive surveys of the new literature) and therefore condensing the text should not be as problematic as in other chapters.	Length is correct.	Yes.
7.F10	The post 2001 list of references is relatively thin, and I wonder whether it represents a portrayal of the extent of new information since TAR.	Now very strong on post-TAR references.	References added, but literatures are limited.
7.F11	Needs figures to break up the otherwise unrelenting text.	Still only 3 figures and 1 table – very dense.	Not much success eliciting additional figures from chapter authors.
7.F12	Little on livelihoods and risk of life. Eg where is the literature on millions at risk.	Not included.	Livelihoods mentioned; millions at risk added.
7.F13	There is no discrimination between effects under different SRES scenarios and under varying mitigation scenarios (but there are some impact assessments of these)	Nothing added in this area.	Literatures on the subjects of this chapter are seldom SRES-related.
7.F14	Are the conclusions reported in TAR Table 7.1 and Figure 7.2 re-affirmed or modified?	Not covered.	See new ES notations.
	Below is a copy of earlier comments ON THE ZERO-ORDER DRAFT by Martin Parry in January 2005:		
7.F15	There is much text that a) appears to replicate what was reported in SAR and TAR; and b) is not sourced on post 2000 references, i.e. is not NEW knowledge.	Not clear – authors don't point out what is new since TAR.	See comments above.
7.F16	The chapter should focus on the key new findings since TAR which either a) confirm and extend TAR findings and deserve re-emphasising, or b) revise TAR findings.	Don't do this.	Most of the chapter's content was not covered in the TAR.
7.F17	Every statement in the assessment should be supported by reference to sources. There is much text that is not.	Still some referencing gaps (see line-by-line comments for examples)	Addressed case-by-case.
7.F18	Some of the key items in TAR might be confirmed or revised: eg revise Table 7.1 and Figure 7.2.	These are not revised.	Too settlement-specific for a much broader chapter.
7.F19	More specific comments The section on current sensitivity could report new knowledge derived from research on (eg) effects of recent extremes on industry etc eg warm summer	This is done with respect to Hurricane Katrina and 2003 European Heat wave	Yes.

	2003 in Europe and similar recent events		
7.F20	Section on assumptions might summarise (table?) pop, income, urbanisation, employment type assumptions in (eg) SRES futures	Don't do this.	Section revised, but not strongly oriented toward SRES.
7.F21	Costs section is thin	Now stronger	Doing our best.
7.F22	Suggest separate sub-sections within Section 5 on: tourism, transportation, manufacturing, retailing etc., urban planing/design (and others listed in outline).	Not done (section is only 2.5 pages long with 1 diagram)	Subsections added in 7.4, appear unnecessary in shorter 7.6.
7.F23	NB Plenary specifically requested coverage of livelihood (including rural) and employment (see Doc 4 p. 31 green book from LA1 Vienna).	Not included	Livelihood included, employment added (subject to literature limitations)
7.F24	Insurance section does not seem to represent new knowledge (source by recent references) as compared with TAR. All statements need sources. Much in the current text is already in the SAR and TAR. There are key areas in SAR and TAR, however, which need confirmation or revision such as Table 8.1 and Figure 8.4.	Doesn't relate back to TAR, so difficult to judge. Insurance references are now generally post-TAR. No revision of Table 8.1 or Fig. 8.4.	See above, subject to severe space constraints.
7.F25	More general comments: Please follow the wording of the section headings in the outline (You have the correct sections: But we would prefer consistent wording between chapters)	Done	Yes.
7.F26	You are not clear about the assumed mean climate change futures in your impact estimates, nor timescales of effects (2030s, 2050s, 2080s, etc)	Not done; say twice that literature doesn't support this.	Does not.
7.F27	Is there enough published science to assess, additionally, effects under a) stabilisation scenarios and b) different SRES futures?	They say not.	Is not.
7.F28	Most generally: you need to think about/prioritise your conclusions regarding what new information about impacts in your several fields (make sure you cover them all, even if to say the new info is limited); and substantiate these.	Not done	Briefly considered in 7.8.
	Chapter 7 SOD comments by Co-Chairs and TSU		Author responses:
7.S1	LENGTH:	Length is correct.	
7.S2	ARE PAO HEADINGS PRESENT?	Yes, exactly	
7.S3	HAVE MOST GENERAL COMMENTS OF ERs FROM ZOD AND FOD BEEN COVERED?	The authors have done the minimum to address the straightforward general comments, but have ignored the more fundamental criticisms. Below is a review	The imposed outline, together with severe space constraints, simply makes it impossible to tell a coherent story. Most reviewers are not aware of the

	that struck to the heart of the matter, and which the authors really haven't addressed.	conditions under which chapter authors must work.
<p>Consider this valuable comment from Bruce Tonn:</p> <p><i>This Chapter covers a very wide range of topics, from the impact of sea level rise on cities to the impact of climate change on tourism. The Chapter does an impressive job of reviewing and synthesizing diverse literatures. The Chapter is very thorough. The bibliography is a very valuable resource. This Chapter can certainly used as a reference for researchers interested in the impacts of climate change on industry, settlement, and society.</i></p> <p><i>The other side of the coin is that the Chapter is not very compelling. It is certainly not as compelling as some of the other draft chapters. Compelling should be interpreted in two ways. First, the Chapter is rather dry; the writing needs some 'punch.' I realize that it is hard to produce a 'hard to put down piece' that is a multi-authored literature review. However, since this piece has the potential to be read in particular by urban leaders around the world, it is important that this Chapter hold the reader's attention.</i></p> <p><i>The second interpretation of compelling relates to the underlying story of the impacts of climate change on human settlements. Soon, over 50% of the world's population will reside in urban areas. Urban economies are increasingly becoming enmeshed in the global economy. Populations in the developed world are aging rapidly. Drought, famine and disease are rampant in developing countries. Truly, climate change could have extraordinary impacts given this context. Yet, climate change is treated, as the report indicates, as simply another stress to 'the system.' Yes, that is true, but to what degree? Is it the first stress among equals? How many people world-wide may lose their homes to rising seas? For how many people who now live at the lower limit of subsistence may climate change be the factor that finally turns them into environmental refugees or into ever rising mortality statistics? How many homes and businesses worldwide may be destroyed each year by storms that are stronger and more frequent because of climate change? How vulnerable is the world's economic system to disruptions attributable to the myriad impacts of climate change? This Chapter addresses these types of questions in generalities (see the Executive Summary) but not in more compelling specifics.</i></p> <p><i>Let's address 'compelling' from the perspective of an urban leader who may read this Chapter. The urban leader will want to find out the threats that climate change poses to his or her human settlement. The leader will find in the Chapter information about a large number of potential impacts of climate change on human settlements and industries. However, in almost all cases, the Chapter does not provide much specific help to the urban leader. The Chapter does not provide a list of cities most threatened by sea level rise, for example. It does not provide a check list of conditions or circumstances that may describe a city and link those descriptors to climate change impacts. Anything that could be done to make the Chapter more useful to urban leaders is encouraged.</i></p> <p><i>It could be that a deeper mining and synthesis of the literature would allow the authors to make more specific and compelling statements about the impacts of climate change on human settlements, industries and society. Even it that is not the case, that the underlying research does not allow more definitive statements, it is very important that Section 7.8 – Key Uncertainties and Research Priorities, be made much more explicit. The future research recommendations are stated in terms of reducing uncertainties and improving understandings of relationships. I would much prefer that the research priorities be stated in more forceful terms, such as: estimates of the number of people who may become environmental refugees because of the impacts of climate change must be developed; and vulnerabilities of specific global economic relationships in specific industries and specific human settlements must be assessed.</i></p> <p><i>Additionally, the list of research priorities should include new research in human settlement designs (including the built environment and infrastructure) that are resilient to the impacts of climate change. Intertwined with this list should be efforts to promote sustainable development, which most by most definitions encompass environmental and economic goals related to resource and land conservation, emissions reductions, and protection of biodiversity. The previous section, 7.7 – Implications for Sustainable Development, is also rather general in this regard. Not much is said in the Chapter about sustainability until this section and the section does not define sustainability very well. The section seems to describe sustainable development within the global economic paradigm whereas many people may believe that sustainable</i></p>		

<p><i>development may actually help shield communities from the potentially disruptive forces of the global economic system. In fact, the Chapter describes how climate change could have possibly severe impacts on regional and global economic relationships. Wouldn't a logical conclusion related to adaptation then be that human settlements become much more sustainable (i.e., rely less on imports, minimize resource requirements, move toward self-sufficiency)?</i></p> <p><i>(Bruce Tonn, University Of Tennessee)</i></p>			
7.S4	ARE REFERENCES BROADLY COMPLETE?	Yes, but some statements are not referenced.	Considered.
7.S5	IS THERE LINE-OF-SIGHT TEXT → ES AND TEXT+ES → TS+SPM?	Yes	Yes.
7.S6	This chapter does the bare minimum to address the concerns of reviewers and, in so doing, it produces a text which is just OK but nothing more. Urgent action is required to produce a final version which will effectively address the needs of policymakers.		See comment above. The imposed constraints have squeezed the life out of this chapter.
7.S7	The authors are clearly concerned not to over-interpret the literature on their topic. No one would advocate over-stretching interpret of the evidence. Yet there are very few hard numbers in this chapter, even where the numbers exists– If you are critical of ‘millions-at-risk’ literature, then you should state them and discuss their weaknesses. And: the Tonn review above gave some very useful pointers as to what could be done even in the absence of hard numbers – check list of urban characteristics and their links to climate change vulnerabilities; list of cities at risk. It’s as if the authors’ primary concern is to avoid being drawn in to saying anything too definite. See page 11 lines 25-32.		The messages of this chapter are the correct ones. Since climate change is a secondary factor in the future of ISS, extrapolating hard conclusions about impacts of climate change is inappropriate based on the existing knowledge bases.
7.S8	Too many statements, and particularly examples, are still unsubstantiated by references – this needs addressing as a matter of urgency – seen line-by-line comments for precise examples..		Considered on a case-by-case basis.
7.S9	In general the language is much more accessible than it was in the FOD, but there are still some sections where this isn't true – for example, 7.6.5.		7.6.5 revised.
7.S10	In the literature cited, and in the point-of-view, there is a bias towards developed countries, and in particular to North America. The authors need to broaden their perspective if they are not to be criticized for this. Related to this, there is a pervasive sense that the authors don't think climate change is a very severe threat. This may well be the case in North America, and over short timescales, but not necessarily in developing countries and up to 2100. Thus in Box 7.3 the authors state that environmental migration will not be ‘one way and permanent’. Why not?		Have done our best to seek broader sources where available, with the help of reviewers.
7.S11	Sub-headings could usefully be used. There are some very long sections with no sub-headings but quite a diverse range of topics. This applies particularly in the sections on Services (7.4.2.2 and 7.6.2), which range from transport to tourism to insurance without the help of any sub-headings.		Added in 7.4.2. Good idea.
7.S12	There is repetition of the causes of impacts – especially the importance of extreme events. It might be worth presenting Table 7.4 earlier to avoid some of this. The authors state many times that changes in extremes are more important than changes in the mean, but this may only be true in temperate latitudes where the climate is relatively temperate. Nearer the Equator, a change in the mean might make whole cities uninhabitable because of, for example, failures in water supply – How probable do the authors think this might be?		Have moderated the emphasis on extreme events to include thresholds associated with more gradual change.
7.S13	<p><u>In summary, the authors need to:</u></p> <ul style="list-style-type: none"> • Make sure all statements, and especially concerning examples, are referenced • Strive to make the chapter more useful for its audience, including quantitative statements with appropriate <i>caveats</i> • Broaden the basis of the literature to include more examples from developing countries, and 		Considered.

	<p>accompany this by improving the balance between consideration of the developing and developed world.</p> <ul style="list-style-type: none">• Make sure the cross-references to other chapters are correct, and try to give at least section numbers if not sub-sections.	
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IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
E-7-1	A	0				Tourism is explicitly and extensively dealt with in the Services system category, regarding vulnerabilities and adaptation issues. While this approach is right, considering that tourism is principally a service sector, it could be more explicitly recognized that tourism is a cross cutting issue, integrates a number of other economic sectors and draws on a wide range of environmental and socio-economic resources. For this reason, I would suggest to include an explication in the initial sections of the Chapter that although tourism aspects are detailed mostly under Services, vulnerability factors and adaptation options described for other systems and for Social Issues are also highly relevant to the tourism sector and to tourism-dependent communities. (Vereczi Gabor, World Tourism Organization (UNWTO))	Considered, but other reviewers felt that tourism is over-emphasized in the chapter.
E-7-2	A	0				The document has been substantially edited and coverage of urban settlement has been expanded. Most of my comments on the first draft have been addressed. I give below a few remaining ones. (Rohinton Emmanuel, University of Moratuwa)	Thank you.
E-7-3	A	0				The chapter does a good job of reviewing a large body of research (e.g., tourism). The title of the chapter, however, implies a still broader scope: industry and settlement are the seat of the driving forces of climate change, but there is no systematic treatment of consumption and investment (to give their economic names). More broadly, economic forces are not discussed as thoroughly as would seem to be demanded by the chapter title. This leads to an underemphasis on a crucial point: that the narrowly economic impacts of climate change are small at a given time and slow to emerge. This characteristic has fueled intense political maneuvering on the part of those who resist mitigation. It would seem to be the duty of IPCC to acknowledge the record of small economic impacts so far, and the economic analyses that forecast similarly small effects into the future, so that the debate going forward can build upon this element of the scientific base of knowledge. Moreover, a frank appraisal of the economic impacts would need to include the market failures that define the appropriation of many of the common-pool resources being altered by climate change. Because these market failures impose localized burdens that poor people cannot easily avoid or buy their way out of, there is a serious equity issue: those with resources cause climate change, those with few resources suffer the consequences. This is surely too broad a statement, but the scientific record that supports or limits it should be appraised. In the current draft, it is not. More real life examples of people and places affected by climate change will help readers grasp the reality of climate change. We realize there are space limitations,	We try to make this point. Limited more by available literatures than by space constraints. Same as above.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						<p>but the text is abstract and hard to link to human experiences such as flooding due to cyclonic storms.</p> <p>A question that may be interesting to explore may be how vulnerable urban settlements are compared to rural settlements with regard to gradual climate change and extreme weather events. In the case of extreme climate events, the complex infrastructure of the urban settlement may be completely disabled and the ecosystem services needed by residents may be interrupted for long periods. Often in rural areas, people depend directly on nature and a sudden climate event may destroy their resource base having a very direct impact on rural citizens. Yet, if the extent of the damage and its timing are relatively fortunate, it can be possible to grow food crops in time to avert famine, for instance.</p> <p>(Kai Lee, Williams College)</p>	A good question, but the available literature does not answer it.
E-7-4	A	0				<p>The authorship team are to be commended on this SOD, it has a much clearer structure and is more concise. Several key points are well emphasized and the chapter has a much improved conclusion. Well done!</p> <p>(Daniel Scott, University of Waterloo)</p>	Thank you.
E-7-5	A	0				<p>The authors will be aware of this, but all of the references in the text need to be rechecked for proper authorship. There are many instances (too many to list) where multiple authored publications have only the first author listed (i.e., missing second author or 'et al.').</p> <p>(Daniel Scott, University of Waterloo)</p>	Checked.
E-7-6	A	0				<p>Research is needed on the impact of climate change on the adaptation capacities of disaster recovering communities, especially in the context of tsunami recovery. AIDMI mapping exercise across 1998 Kandla Cyclone, 2000 drought, 2001 earthquake, and 2005 floods in Gujarat shows that: (a) often disaster recovery and climate change adaptation recovery overlap for local communities; (b) this overlap is increasingly more frequent; (c) this overlap more often makes efforts of the communities more difficult than otherwise; and (d) among such efforts there are best practice examples, but unrecorded. The research and applications should be practical. The AIDMI Community Survey of Gujarat Earthquake 2001 (which was an earthquake in ongoing repeat drought) with the support for World Bank and under the auspices of ProVention indicated that long term recovery studies are one way to practically research such local application and local adaptation measures are often accelerated with economic support or measures when available.</p> <p>(Silvia Llosa, ISDR System)</p>	Point added.
E-7-7	A	0				<p>In general, conclusions seem to stem from a comparison between developed and developing countries. We believe that it would be more appropriate to address the</p>	Considered by LAs for their relevant sections. Thank you.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						<p>peculiarities of different geographical regions of the world irrespective of their level of industrialization.</p> <p>We feel that more case-studies from developing countries should be provided in the chapter.</p> <p>Our comments include the following new source of literature that we recommend for inclusion in the references' list:</p> <ol style="list-style-type: none"> 1. ADRC, Japan and CRED-EMDAT, Universite Catholique de Louvain, Brussels, Belgium, 2004 2. Natural Disasters Data Book – 2004. An analytical Overview, March 2005 Asian Disaster Reduction Centre 3. UN-Habitat report: Changes in Asia’s fast growing cities are closely watched across the world at www.citymayors.com/society/asian_cities.html 4. Climate Change Futures: Health, ecological and economic dimensions. 2005. Paul R. Epstein and Evan Mills (www.climatechange-futures.org) 5. Report of 2nd International Work Conference on climate change and disaster risk reduction, The Hague, NL, June 2005 (www.climatecenter.org) 6. Know Risk UNISDR 2005 Tudor Rose publisher (http://www.know-risk.org/) 7. Living with risk: a global review of disaster risk reduction initiatives UNISDR 2004 (http://www.unisdr.org/eng/about_isdr/bd-lwr-2004-eng.htm) 8. F. Sperling and F. Szekely (2005). Disaster Risk Management in a Changing Climate. Discussion Paper prepared for the World Conference on Disaster Reduction on behalf of the Vulnerability and Adaptation Resource Group (VARG). Reprint with Addendum on Conference outcomes. Washington, D.C. (Silvia Llosa, ISDR System) 	
E-7-8	A	0				<p>Altogether, this remains a good chapter. The definitions of resiliency, sensitivity, vulnerability, etc. have to be consistent throughout WG II. A box on Katrina is certainly called for but it should be documented as a social process mainly. (Philippe Crabbé, University of Ottawa)</p>	Thank you.
E-7-9	A	1	7			<p>Missing period at end of sentence (Dana Coelho, University of Maryland)</p>	Thank you.
E-7-10	A	3	1			<p>Comment on Executive Summary: The effort to try and be consistent with IPCC indication of confidence levels seems to be exaggerated here and there. General findings, relevant for the messages of the ExecSum, are often based on (largely common sense driven) observations, at best illustrated with anecdotes and individual cases. The label VERY HIGH CONFIDENCE suggest some form of statistical underpinning which is rarely if at all supported by the chapter.</p>	ES substantially revised, but confidence levels remain judgmental.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						Obviously, this conflict between attempting to be consistent throughout the AR4 with being meaningful and relevant is more generic than just this chapter (e.g see the TS!). But the fourth bullet under 'The context for Assessing Vulnerabilities' is a good example of my concern. (Tom Kram, Netherlands Environmental Assessment Agency)	
E-7-11	A	3	9		13	Confusing wording, consider the following: "Inherent uncertainties in predicting the path of technological and institutional change and trends in socioeconomic development over a period of many decades limit the potential to predict future prospects for industry, settlements, and society involving climate change, be it minimal or considerable. In many cases, therefore, research to date has tended to focus on vulnerabilities to impacts rather than on projections of impacts of change." (Dana Coelho, University of Maryland)	Matter of stylistic preference.
E-7-12	A	3	16			consider a synonym for "related" (i.e. "due to") or the following wording: "Key vulnerabilities of industry, settlement, and society are most often related to (a) climate phenomena that exceed thresholds for adaptation via overwhelming rates and magnitudes of climate change, particularly extreme weather events and/or abrupt climate change, and (b) limited access to resources..." (Dana Coelho, University of Maryland)	We prefer the current wording.
E-7-13	A	3	25	3	27	Unclear and seemingly inconsistent language: 1st sentence says it is NOT gradual CC that matters; sentence 2 suggest gradual CC is inextricably linked with extremes and thus relevant for impacts and exposure. Reformulate. (Tom Kram, Netherlands Environmental Assessment Agency)	We do not see an inconsistency.
E-7-14	A	3	25	3	27	This statement is not general enough- issues like sealevel rise, absence of meltwater, and drought are examples of grave but gradual impacts that are relevant, but excluded. (Andrew Dlugolecki, University of East Anglia)	Some editing done.
E-7-15	A	3	25		32	This section may place too strong an emphasis on the predominant role of extreme events in determining vulnerability, in relation to the potential for long-term and potentially fundamental changes to cultures and communities arising from more gradual climate change impacts. Major losses and disruptions to society may ultimately occur from densifying land use in floodplains, salinization of agricultural lands, reduced food availability in drought areas, etc. Perhaps the language should be modified to emphasize that near-term vulnerabilities (or perceived vulnerabilities) are mainly due to extreme weather events. There is a risk that the current emphasis could be interpreted to support policy-maker tendencies to ignore the long term consequences in favour of the obvious near-term threats, rather than balancing these, as referenced in Ch. 17 p38 line 34. I could only find one	Edited.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						reference (NACC, 2000, on page 11, line 48) to back up the assertion on the importance of extreme events over gradual trends; it is acknowledged that actual adaptation may be triggered mostly by extreme events. (Stephen Sheppard, University of British Columbia)	
E-7-16	A	3	29	3	31	I understand the need to be high-level, but the importance of social underclasses merits it being mentioned here. (Andrew Dlugolecki, University of East Anglia)	See revised ES.
E-7-17	A	3	31			consider using "other non-climate sources of change" instead of "other" underlined for clarity (Dana Coelho, University of Maryland)	Agreed.
E-7-18	A	3	33	3	35	we would like to emphasize here again the importance of studying and taking regional characteristics into account for extremes and gradual changes to obtain representative results. (Silvia Llosa, ISDR)	Incorporated elsewhere.
E-7-19	A	3	33	3	35	Intention is probably correct, but by no means exclusively -or even more- true for vulnerability than for a plethora of other phenomena. The challenge for more aggregate models and estimates is to try and capture the underlying richness in a meaningful way. Reformulate or drop. (Tom Kram, Netherlands Environmental Assessment Agency)	The fact that it is true for a wide variety of phenomena is no reason to drop it here.
E-7-20	A	3	33	3	33	Drop "relatively" (Tom Kram, Netherlands Environmental Assessment Agency)	Accepted.
E-7-21	A	3	34	3	34	'social' could be added before 'sectoral' (Silvia Llosa, ISDR)	Accepted.
E-7-22	A	3	42	3	45	urban and peri-urban areas could be explicitly mentioned in this paragraph, as well as arid and semi-arid areas (Silvia Llosa, ISDR System)	See changes in ES.
E-7-23	A	3	46	3	48	add notion that income growth adds to accumulation of assets in vulnerable areas, not just number of people (Tom Kram, Netherlands Environmental Assessment Agency)	See sections on insurance, etc.
E-7-24	A	4	1			delete "impacted" (Dana Coelho, University of Maryland)	Reworded.
E-7-25	A	4	5		8	Does the statement imply that "lifestyles will change" is a bad and high cost implication of climate change? (Dana Coelho, University of Maryland)	No, see second sentence.
E-7-26	A	4	9	4	12	This seems at the least HIGH CONFIDENCE to me (Andrew Dlugolecki, University of East Anglia)	That is also our opinion, but supporting research is limited.
E-7-27	A	4	9	4	12	this paragraph could be more explicit as to the present vulnerability factors of poor	See later parts of the chapter.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						communities and households, this includes complex disasters and conflicts, epidemics such as HIV/AIDS. Their limited capacities to assess, reduce risk and cope with impacts of climate-related and other disasters today, decreases their capacity to address longer-term changes. 'and increase resilience' could be added after 'coping'. Actually throughout the report the differences between coping and adaptation is not discussed and clarified. (Silvia Llosa, ISDR System)	
E-7-28	A	4	14	4	14	I suggest "restrict" rather than "withdraw"- withdrawal is only one option. (Andrew Dlugolecki, University of East Anglia)	Expert LA disagrees.
E-7-29	A	4	20	4	20	Use of the word "can" (repeated on I.23) is at odds with confidence level, Unclear what exactly is said with VERY HIGH CONFIDENCE: the fact that adaptation can be helpful or under-performance of options? (Tom Kram, Netherlands Environmental Assessment Agency)	Revised.
E-7-30	A	4	21		22	replace "settlement" with "settlements" for consistency; consider deleting repeated "industry, settlement, and society" (Dana Coelho, University of Maryland)	See chapter title.
E-7-31	A	4	23	4	24	the statement appears one-sided ignoring the coping capacity of local communities in areas affected by recurrent disasters. Lack of action associated with extreme weather events cannot be the sole reason influencing the prospects for adaptation (Silvia Llosa, ISDR)	Eliminated.
E-7-32	A	4	23	4	25	Correctly suggests that 'wake-up calls' can be influential, but frequent reference to storms and hurricanes in the chapter are questionable, as the relation with frequency and intensity remain highly speculative in many instances. (Tom Kram, Netherlands Environmental Assessment Agency)	Same as above.
E-7-33	A	4	23	4	23	Change "Prospects for adaptation ..." to "Propensity to adapt. . .". (Tom Kram, Netherlands Environmental Assessment Agency)	Same as above.
E-7-34	A	4	23	4	25	Bullet point is obscure. Is this a garbled version of p. 40, ll. 42-45? The latter is listed as "high confidence." (Kai Lee, Williams College)	Same as above.
E-7-35	A	4	23		27	This sentence could be modified to acknowledge that there are other triggers for adaptation and other potential methods for providing a "strong signal" about risk, beyond extreme weather events. This includes the provision of information in a useful and compelling manner to overcome limited understanding and awareness (see Ch. 17.4.2.4). (Stephen Sheppard, University of British Columbia)	Same as above.
E-7-36	A	4	23		24	Confusing sentence. The risk signal is coming from a lack of action? (Dana Coelho, University of Maryland)	Same as above.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
E-7-37	A	4	32	4	34	What is the message here? Is industry wrong by only reacting to market signals? Or is it too short-sighted to recognize opportunities? Or is it the lacking market signals, and if so, who should act on that? (Tom Kram, Netherlands Environmental Assessment Agency)	Same as above.
E-7-38	A	4	32	4	34	The second sentence here seems rather obscure- use clearer language. (Andrew Dlugolecki, University of East Anglia)	Same as above.
E-7-39	A	4	35			suggest also highlight that taking adaptation actions before full impacts of climate change have occurred is more cost-effective than waiting to take action after full impacts have occurred. (Paul Kirshen, Tufts University)	Same as above.
E-7-40	A	4	36	4	41	Here again, it could be noted that we don't start from scratch. Since disaster risk reduction measures address today's impacts of climate variability and extremes, research on the continuum from present to future climate change is a key starting point to improve response capacities as efficiently and quickly as possible. (Silvia Llosa, ISDR System)	Same as above.
E-7-41	A	4	36			Consider here and elsewhere consistency in use of policymaker and decisionmaker (hyphen, space, single word?) (Dana Coelho, University of Maryland)	Considered.
E-7-42	A	5	5	5	6	This is also true of sectors such as Agriculture. This is an odd beginning for the chapter. (Jean Palutikof, Met Office)	We think this sets the stage appropriately.
E-7-43	A	5	11	5	11	add 'variability' in front of 'change'; add 'technical' to 'financial'; 'access to information and knowledge' could also be added to the list of capacities (Silvia Llosa, ISDR System)	We agree, but we are reporting what the cited reference says.
E-7-44	A	5	14		16	Syntax unclear. Suggest this change: "for instance, new buildings can help occupants cope with changing climate, but this adaptation may increase emissions of greenhouse gases due to increases in air conditioning. The adaptation benefits occupants but adds to the global burden of climate change." (Kai Lee, Williams College)	Revised.
E-7-45	A	5	15		16	consider "heating and cooling" instead of "climate conditioning" (Dana Coelho, University of Maryland)	Changed.
E-7-46	A	5	25	7	29	This is an excellent statement of the problem which should be retained in future drafts and highlighted in higher level summaries. (Lenny Bernstein, L.S. Bernstein & Associate, L.L.C.)	Thank you.
E-7-47	A	5	25			"settlements" instead of "settlement" (Dana Coelho, University of Maryland)	See chapter title
E-7-48	A	6	1		2	Consider instead: "First, climate change is one of a set of multiple stresses	Sylistic preference

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						operating at diverse spatial and temporal scales." (Dana Coelho, University of Maryland)	
E-7-49	A	6	3			"climate-sensitive" instead of climate sensitive (Dana Coelho, University of Maryland)	Accepted.
E-7-50	A	6	5	6	5	add 'environmental' after 'socioeconomic' (Silvia Llosa, ISDR System)	Not found in the text.
E-7-51	A	6	26		28	Do authors mean that the conclusions are hard to generalize from place to place and context to context? If so, it would be good to identify "no regrets" adaptations that are revealed by the chapter's discussions, as well as dysfunctional adaptations that policies should attempt to redirect (e.g., increased air conditioning in response to warmer climate). (Kai Lee, Williams College)	We try to do this in appropriate sections.
E-7-52	A	6	34			"settlements" instead of "settlement" (Dana Coelho, University of Maryland)	See above.
E-7-53	A	6	39	6	39	add 'natural hazards' after 'disease' (Silvia Llosa, ISDR System)	Items listed are illustrative.
E-7-54	A	6	39		40	Consider instead: "It is in complex interactions with social contexts that climate change can make a difference..." (Dana Coelho, University of Maryland)	We prefer the current wording.
E-7-55	A	6	48			Insert "and" after "cooling" (Kai Lee, Williams College)	Accepted.
E-7-56	A	6	48			"and" reduce costs of heating (Dana Coelho, University of Maryland)	Accepted.
E-7-57	A	7	2			"than gradual change", because they offer less time... (Dana Coelho, University of Maryland)	Accepted.
E-7-58	A	7	19			delete "with" (Dana Coelho, University of Maryland)	Accepted.
E-7-59	A	7	22			here and elsewhere use either sea level or sea-level consistently (Dana Coelho, University of Maryland)	Accepted.
E-7-60	A	7	25		26	Citation or explanation? Because urban areas concentrate people, infrastructure and economic activity. (Dana Coelho, University of Maryland)	See TAR.
E-7-61	A	7	39			this section could include information concerning the increasing number of small to medium-size disasters that in recent decades hit the Asian continent. In 2004 alone, out of the total of 131 million people affected by natural disasters in Asia, as much as 97% were affected by weather-related disasters (drought, extreme temperature, floods, slides, windstorms (source: ADRG, Japan and CRED-EMDAT, Universite	Space limitations here; mainly covered in Chapter 1.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						<p>Catholique de Louvain, Brussels, Belgium, 2004). Within Asia and Pacific, the risks faced by coastal/riverine regions with high population (Bangladesh, Mekong Basin, Indo-Gangetic Plain, Vietnam, Indonesia) and small island nations (South Pacific Islands, Maldives is significant. More so, because these areas are also among the world's most populated areas. Viewed in economic terms, Asia accounts for more than two third of the economic damage caused by natural disasters in the year 2004 (Natural Disasters Data Book – 2004. An analytical Overview, March 2005 Asian Disaster Reduction Centre).</p> <p>In Asia there are large concentration of human settlements with significant proportions engaged in occupations that have direct relationships to effects of climate change. The continent now holds 61 per cent of the global population and its share of the global urban population has risen from 9 percent in 1920 to 48 percent in 2000 and is expected to rise to 53 percent by 2030 (Changes in Asia's fast growing cities are closely watched across the world. see the report by UN-Habitat (www.citymayors.com/society/asian_cities.html)). A major contribution to this high rate of urbanization in the developing countries of Asia are the strong trends of rural-urban migration in recent decades. Primary sectors of the economy can no longer sustain growing population and impacts of natural disasters such as floods and droughts. There is thus a push towards secondary and tertiary sectors in urban areas. Urban areas fare no better in terms of living conditions and risk. Disasters striking urban areas cause far more damage in terms of life loss and economic loss than they do in rural hinterlands. Climate change and its impacts thus have a strong influence on the patterns of human settlements in developing countries.</p> <p>This section should also address present internal and international migration. Migration is linked to extreme and gradual changes. Secondly, social inequities have widened as a result of changes in production systems often leading to conflict, debt and hunger. They are all ripple effects of climate change and should be addressed.</p> <p>We fell that this section devotes disproportionate attention to the tourism sector. While strong market forces and the nature of investments do warrant the need for such studies, it appears to ignore the plight of a larger proportion of population and economy that is dependent on other trades and may be equally (if not more) sensitive to climate change impacts. The range and nature of natural disasters striking developing countries, provide strong evidence of the effect on tertiary sectors of economy outside tourism.</p> <p>(Silvia Llosa, ISDR System)</p>	<p>Space allocation reduced, but tourism is important to the GDP of a number of locations and has not been specifically addressed by previous IPCC assessments.</p>

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
E-7-62	A	8	1			change ozone to "ozone (as a lea gas)" (Andreas Matzarakis, Meteorological Institute)	Not a meaningful addition for most readers.
E-7-63	A	8	2	8	3	Does exposure to health threats come correctly under 'Environmental Quality'? (Jean Palutikof, Met Office)	Yes, as an indirect effect.
E-7-64	A	8	5		15	This paragraph demonstrates an overall weakness in the chapter: the exposition could be clarified by explicit reference to ecosystem services and the role of infrastructure. Material well-being is captured, to a large extent, by the effectiveness of the nature-human interface: low-cost, convenient access to water, air, food; protection from adverse climatic conditions, including extreme events, protection from pathogens (e.g., in water). Much of "nature" in this sense consists of ecosystem services in the sense spelled out in the Millennium Ecosystem Assessment. Infrastructure, broadly, consists of physical capital that connects ecosystem services to end-users (e.g., water pipes, seawalls to protect against storm surges). Much of that connection, as the passage in the text observes, is "linkage." But what matters is not the linkage but the provision of ecosystem services to support human well-being. This perspective might be used more widely in the chapter. (Kai Lee, Williams College)	Comment added.
E-7-65	A	8	6			remove "systems" from "information systems" (Dana Coelho, University of Maryland)	No, the point is about linkage infrastructures.
E-7-66	A	8	7			change "severe storm damage" to "severe storms". Damage is not an event. (Dana Coelho, University of Maryland)	Changed.
E-7-67	A	8	17	8	22	disruption of social networks and means to sustain livelihoods' could be added after 'shelters' (Silvia Llosa, ISDR System)	Added.
E-7-68	A	8	26	8	26	Box can be removed (Box is more relevant for Chapter 8) (Andreas Matzarakis, Meteorological Institute)	WG II issue.
E-7-69	A	8	28		29	"some aspects of societies" is a very vague comment, can this be more specific or removed? (Dana Coelho, University of Maryland)	Box redone.
E-7-70	A	8	31			"25-30 percent of all food-related" (Dana Coelho, University of Maryland)	See above.
E-7-71	A	8	34			inadequate climate conditioning implies air conditioning. Suggest excess overheating in buildings. (Geoff Levermore, Manchester University)	See above.
E-7-72	A	8	47	8	48	It seems to me that the terms "resilience" and "sensitivity" are used interchangeably. It is a matter of definition but, for me, sensitivity is more a	See glossary; both are social dimensions.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						physical property of the system while resilience includes a social dimension. (Philippe Crabbé, University of Ottawa)	
E-7-73	A	8	48	8	51	Why does this text come under 'Social Systems'? (Jean Palutikof, Met Office)	Largely moved.
E-7-74	A	8	50			change "cases" to "plants" (Dana Coelho, University of Maryland)	Changed as appropriate.
E-7-75	A	9	2	9	7	this paragraph could address the fact that livelihood security is adversely affected at the grassroot level by underemployment and loss of assets. There is also a significant proportion of working population in the 'marginal workers' category, whose quality of life is far more sensitive to even small changes in climate. (Silvia Llosa, ISDR)	Not a climate sensitivity issue.
E-7-76	A	9	2		4	Consider instead: "Climate can be a factor in an area's comparative advantage for economic production and growth by affecting assets essential to the production of commodities and services, from agricultural and fibre products (Chapter 5) to tourism." (Dana Coelho, University of Maryland)	Each part starts with a simpler declarative sentence.
E-7-77	A	9	5			"affect" not "affects" (Dana Coelho, University of Maryland)	Changed.
E-7-78	A	9	9	9	12	recent research also suggests that rising CO2 concentrations stimulates trees and soil fungi to produce an inordinate amount of pollen and spores, which contributes to acute and chronic lung diseases. Other causes of respiratory diseases such as exacerbated dust clouds and wildfires are also projected to adversely affect respiratory health. (see 'Climate Change Futures: Health, ecological and economic dimensions'. 2005. Paul R. Epstein and Evan Mills) (www.climatechange-futures.org) (Silvia Llosa, ISDR System)	Yes, but covered in the Health Chapter.
E-7-79	A	9	12			remove "cascading" (Dana Coelho, University of Maryland)	Done.
E-7-80	A	9	12			Insert "especially in advance" after "impacts" (Kai Lee, Williams College)	Done.
E-7-81	A	9	20	9	43	Some other climatic limitations for tourism activity should be pointed, e.g. heat waves, floods, heavy rains and snow falls (Krzysztof Blazejczyk, Institute of Geography and Spatial Organization, Polish Academy of Sciences)	Edited, subject to space limitations.
E-7-82	A	9	20	9	34	Climate change affects tourism; however, you could address the fact that tourism exacerbates climate change impacts and affects resilience through direct contact between tourists and coral, boat and anchor damage and unsustainable harvesting	Considered for water, coral reefs, and energy consumption.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						activities for recreation and commerce. (Silvia Llosa, ISDR System)	
E-7-83	A	9	20	9	20	Again the term sensitivity is used here. I would have used resilience but, again, it is a matter of consistency with the definitions selected. (Philippe Crabbé, University of Ottawa)	Yes.
E-7-84	A	9	20			I still disagree with the statement that 'Tourism ... is an economic sector whose sensitivity to climate has been comprehensively analysed.' There are several recent publications that conclude we are only beginning to understand this, some of which are being cited in the 4AR (e.g., work by Scott, Hamilton, Gossling and Hall and others). My objection is primarily to the word 'comprehensive', because it suggests we know much more than we do. An alternative might be: "Tourism is one economic sector where there has been substantive recent research to understand its sensitivity to climate." (Daniel Scott, University of Waterloo)	Changed, although space limitations make it impossible to cite all interesting source material.
E-7-85	A	9	21			the 'Martin' reference is actually 'Gomez-Martin' - correct the references section as well (Daniel Scott, University of Waterloo)	Changed.
E-7-86	A	9	21			insert) after Martin 2005 (Dana Coelho, University of Maryland)	Done.
E-7-87	A	9	22			the 'Scott' reference needs to be corrected, but more importantly, a better reference for the 'recent emphasis on climate change' is the following book chapter that details the evolution of research on tourism, climate and climate change: 6. Scott, D., Wall, G., McBoyle, G. (2005) The Evolution of the Climate Change Issue in the Tourism Sector. In: Tourism, Recreation and Climate Change. M. Hall and J. Higham (eds). London: Channelview Press. 44-60. (Daniel Scott, University of Waterloo)	Accepted.
E-7-88	A	9	22			Suggest to add after first phrase: Climate is a key resource for tourism, considering that favourable climatic conditions at destinations are key attractions for tourists. It is especially true for beach destinations and the conventional sun-and-sea segment, which is still the dominating form of tourism. (Frangialli F, 2005, Climate as a Resource for Tourism, speech at the Technical Conference on Climate as a Resource, 14th Session of the World Meteorological Organization Commission for Climatology, Beijing, China) (Vereczi Gabor, World Tourism Organization (UNWTO))	Considered , but space limitations constrain what could be added.
E-7-89	A	9	22			Change "ones" to "Jones" in citation. (Kai Lee, Williams College)	Yes.
E-7-90	A	9	22			"ones"??	Yes.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						(Dana Coelho, University of Maryland)	
E-7-91	A	9	27	9	27	add 'floods and disease outbreaks' (Silvia Llosa, ISDR System)	Changed.
E-7-92	A	9	34			Suggest to add at the end of the paragraph: Tourism activities are highly concentrated in space and time, which increases tourism's impacts on the use of environmental resources, and consequently its vulnerability to climate change impacts. In most tourism destinations the water consumption significantly increases during the high seasons due to the sharp rise in tourist volumes, which often coincides with dry periods when the availability of freshwater resources is limited or reduced. (Vereczi Gabor, World Tourism Organization (UNWTO))	Considered, subject to length limitations (other reviewers think the tourism discussion is already too long)
E-7-93	A	9	34			discharges of untreated wastes' - this makes it sound as if this is common place or the norm in the tourism industry, which is not the case and unfairly portrays the tourism industry (Daniel Scott, University of Waterloo)	Modified.
E-7-94	A	9	35			A box or table with environmental resources on which tourism depends can be of advantage (Andreas Matzarakis, Meteorological Institute)	Would be nice, but space limitations prohibit.
E-7-95	A	9	36			'snow cover' is redundant and can be removed (Daniel Scott, University of Waterloo)	Changed.
E-7-96	A	9	37	9	39	References to these 'numerous studies' are required. (Jean Palutikof, Met Office)	Cross-references added.
E-7-97	A	9	37			numerous studies' - the following reference summarizes and compares the results of this international literature and could serve as a useful single citation for readers: 2. Scott, D. (2005) Global Environmental Change and Mountain Tourism. In: Tourism and Global Environmental Change. S. Gossling and M. Hall (eds). London: Routledge. 54-75. (Daniel Scott, University of Waterloo)	Cross-references added.
E-7-98	A	9	44			Suggest to add to the last paragraph of the page: Tourism is a highly seasonal activity and changes in demand patterns caused by altered climatic conditions can have major impacts on local tourism businesses, employment and supply, also affecting related services and sectors (such as agriculture, handicrafts and construction). (World Meteorological Organization 2005, Climate and Tourism, in World Climate News, n. 26) (Vereczi Gabor, World Tourism Organization (UNWTO))	Section revised and shortened.
E-7-99	A	9	46	11	9	Section is unclear in its treatment of urbanization in poor countries. Reference to chapter 6 (p. 10, l. 16) suggests that demography is the subject of another chapter.	Section rewritten.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						Even so, this chapter needs at least a) an image showing effect of sea-level rise on an existing populated area such as Bangladesh, and b) an estimate of the populations already at risk from sea-level rise or storm surges, with projections into the future. A focus on ecosystem services (above) might also lead logically to mention of the populations dependent upon snowpack and glacier-fed water supplies, and expansion in range of disease vectors. All this might require cutting the chapter elsewhere, but the current articulation gives an impression of superficiality in discussing urbanization and its implications for the context in which climate change unfolds. (Kai Lee, Williams College)	
E-7-100	A	10	21			why aren't doubling times given for all areas? (Dana Coelho, University of Maryland)	Table removed.
E-7-101	A	10	21			Table 7.1: Worthwhile to add the caveat that UN uses country-by-country definitions of what constitutes an urban area, which differ enormously and make that numbers should be treated with due care (Tom Kram, Netherlands Environmental Assessment Agency)	Table removed.
E-7-102	A	10	21			Table 7.1: Suggest to delete the doubling time columns: it does not add anything to conclude that the expected doubling time is 57-59 years over a 30-year period (Tom Kram, Netherlands Environmental Assessment Agency)	Table removed.
E-7-103	A	10	27			Why not at least acknowledge the relevance of the post-SRES/stabilisation scenarios as well, consistent with recommendations in SPM p.18 line 34? (Stephen Sheppard, University of British Columbia)	Section rewritten.
E-7-104	A	10	37	10	41	I like the concept of a barbarization scenario, as it seems quite realistic. As it is unfamiliar, can a bit more be said about the emissions implications please. (Andrew Dlugolecki, University of East Anglia)	Section rewritten, but discussion kept.
E-7-105	A	11	12			this section could use more results from the impacts of extreme weather-related events as indications of the likely effects of future climate change. (Silvia Llosa, ISDR)	See box on Katrina later in this section.
E-7-106	A	11	14			here and elsewhere use "settlements" instead of "settlement" (Dana Coelho, University of Maryland)	See chapter title.
E-7-107	A	11	15			remove 'grained' ... 'fine geo and sectoral scale' is fine (Daniel Scott, University of Waterloo)	Technically correct term.
E-7-108	A	11	20	11	22	Is it the place here to define vulnerability? (Philippe Crabbé, University of Ottawa)	See glossary.
E-7-109	A	11	42	11	43	"Cumulative" and additive are maybe the wrong terms: a better contrast with systematic, process effects is capital, stock effects (Andrew Dlugolecki, University of East Anglia)	Terminology widely used in the global change literature; citation added.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
E-7-110	A	11	45			Delete 'along with climatic extremes' (Jean Palutikof, Met Office)	Done.
E-7-111	A	11	47			does "location" refer to new locations of these intense storms? (Dana Coelho, University of Maryland)	Word added.
E-7-112	A	12	5	12	6	I don't think Katrina is a good example of an exception. "Only" about 1300 people died, and the economic costs , including energy market disruption, have been put as high as \$300 billion. A better example would be the 2003 European heatwave. (Andrew Dlugolecki, University of East Anglia)	We disagree; see population dislocations.
E-7-113	A	12	13	12	13	loss of biodiversity and desertification' could be added (Silvia Llosa, ISDR System)	Not specific to this chapter.
E-7-114	A	12	14			change "water supply and power supply" to "water and power supplies" (Dana Coelho, University of Maryland)	Done.
E-7-115	A	12	15	12	15	add 'and maintain sustainable livelihoods' after 'other social needs' (Silvia Llosa, ISDR System)	Done.
E-7-116	A	12	22	12	25	Given the attention to tourism on page 9 lines 20-43, it is worth noting that tourism is also vulnerable to mitigation policy. This point is made later, but can be introduced here. (Andrew Dlugolecki, University of East Anglia)	Edited. This paragraph has drawn criticism from government reviewers and needs to be kept short and general.
E-7-117	A	12	22	12	25	By introducing absolute quantitative emission reduction targets, a cap and trade emissions trading system sets artificial restrictions on growth, potentially jeopardizing the industry's competitiveness. Furthermore, if the imposed absolute targets are not consistent with technological innovation and capital stock turnover, the scheme sets severe limitations on market liquidity and creates significant barriers to effective implementation. (James Bero, BASF)	Discussed in the WG III report.
E-7-118	A	12	27	12	39	This paragraph makes a significant point but does not draw what seems like an obvious conclusion: building robust economic ties with the globalizing economy and continuing with economic development are the best defense against changing climate for a society built around small-scale social interactions and enterprises. Do authors want for that implication to be drawn by others, without commenting on it here? (they may) (Kai Lee, Williams College)	Belongs in the adaptation section rather than the impact section: added there.
E-7-119	A	12	29			delete "a large" before region (Dana Coelho, University of Maryland)	No, needed here for emphasis.
E-7-120	A	12	34	12	34	Citing Mendelsohn alone , who is a notorious sceptic on climate change, is unbalanced, and taking a 2001 reference is also too old. For balance and a more recent view, look at C. Kemfert "Global Climate Protection-immediate action will	Such additional soft references do not add strength.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						avert high costs" Weekly Report of German Institute for Economic Research (DIW Berlin), 12/2005 April 28th 2005 Volume 1 pages 135-141 and also her earlier piece in same publication "The Economic Costs of Climate Change" Weekly Report, 2/2005 January 21st 2005, Volume 1 pages 43-49.. (Andrew Dlugolecki, University of East Anglia)	
E-7-121	A	12	49			section 7.4.2.1 does not mention impacts on other renewable sources of energy such as solar, tidal, geothermal (Silvia Llosa, ISDR System)	Impacts on climate-sensitive renewable energy sources are mentioned; the best documented examples are hydro and windpower.
E-7-122	A	13	7	13	13	One aspect that I have not seen covered in the literature, but could be very important, is that the production chain is now globalised, with huge international flows of finished and semi-finished goods, not just raw materials. In addition, much of the work is increasingly located in developing countries for cost reasons. However, these are the very countries that are vulnerable to climate change impacts. Thus industrial sectors are also becoming more vulnerable. (Andrew Dlugolecki, University of East Anglia)	Covered briefly in 7.4.2.2 and Figure 7.2.
E-7-123	A	13	20			necessary to distinguish between Hurricane Katrina and "Katrina tropical cyclone"? (Dana Coelho, University of Maryland)	Considered interchangeable terms.
E-7-124	A	13	22			Change "less premature" to "slower" (Kai Lee, Williams College)	Terminology drawn from the research literature.
E-7-125	A	13	31		32	change "closely-related" to "closely related" (Dana Coelho, University of Maryland)	Accepted.
E-7-126	A	13	36	13	42	Is this paragraph about small-scale industry or about developing country industry? The writer seems to think all industry in developing countries is small-scale, but in fact globalisation is pushing large scale manufacture into developing countries. (Andrew Dlugolecki, University of East Anglia)	Text edited.
E-7-127	A	13	44	14	9	Non clear is opposition between use of electricity for cooling and coal, oil gas etc. for heating (lines 48-51). In many countries coal, oil, gas is in use to produce electricity. So those mediums are use both, for cooling and for heating. (Krzysztof Blazejczyk, Institute of Geography and Spatial Organization, Polish Academy of Sciences)	Text edited.
E-7-128	A	14	6			add "the" before USA (Dana Coelho, University of Maryland)	Accepted.
E-7-129	A	14	17	14	23	Market and governmental incentives are essential before an industry can afford to invest in for GHG mitigation. Lower energy costs through use of process integration and co-generation is currently driving GHG mitigation, but more could be done by governments.	This is an opinion, not a research finding.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						(James Bero, BASF)	
E-7-130	A	15	1	15	3	while cognisant of space restrictions, can a few citations be provided for this sentence (perhaps California study on water issues, new work from Quebec, or many other international examples). (Daniel Scott, University of Waterloo)	2 references added.
E-7-131	A	15	5	15	15	Another significant effect on supply is that higher temperatures reduce the efficiency of power distribution, and also of thermal cooling in non-nuclear power stations. (Andrew Dlugolecki, University of East Anglia)	Impacts mentioned.
E-7-132	A	15	9		10	Consider the following to avoid repetition: "...electricity transmission and distribution networks and oil product storage facilities. Fossil fuel production facilities (particularly off-shore units) and energy..." (Dana Coelho, University of Maryland)	Edited.
E-7-133	A	15	11	15	13	It is important to note that permafrost thaw may interfere with the operation of these facilities even if climate change did not occur as permafrost thaw can occur due to construction related disturbance of the surface and also operation of the structure. The design of these structures therefore needs to (and often does in many places especially since mid 20th century) consider permafrost thaw even if climate warming did not occur. (Sharon Smith, Natural Resources Canada)	Point and reference added.
E-7-134	A	15	17	15	23	Third sentence begins 'In contrast' but is talking about energy demand and not coal. (Jean Palutikof, Met Office)	Contrast refers to difference between reference and strong mitigation scenarios
E-7-135	A	15	19		22	Confusing wording... referring to % coal use (to generate electricity?) and "final energy demand" almost interchangeably. (Dana Coelho, University of Maryland)	Clarified.
E-7-136	A	15	22	15	23	Sentence beginning 'Kuik (2003)' needs rewording if it is to be useful to the intended audience of the AR4. (Jean Palutikof, Met Office)	Accepted.
E-7-137	A	15	25	18	48	Sub-headings are needed to keep this section on track. (Jean Palutikof, Met Office)	Added.
E-7-138	A	15	25			section 7.4.2.2 does not address impacts on emerging financial services for adaptation of communities to weather and climate-related risks, including microinsurance, social protection funds etc (source of information include 'Report of 2nd International Work Conference on climate change and disaster risk reduction', The Hague, NL, June 2005 (www.climatecenter.org) and Know Risk UN 2005 (www.unisdr.org)) (Silvia Llosa, ISDR System)	Considered, but limited by space constraints.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
E-7-139	A	15	28			change: tourism to "Leisure/recreation" (Andreas Matzarakis, Meteorological Institute)	The term is "recreation and tourism"
E-7-140	A	15	50	15	50	Passengers, travellers and their business and social associates are also impacted by extreme events! (Andrew Dlugolecki, University of East Anglia)	Note added.
E-7-141	A	15	51	16	2	Although this sentence is meant to highlight uncertainties, "there may be linkages" is so vague that it is hard for reader to understand what point is being made. May be better to delete sentence. (Kai Lee, Williams College)	Some edits made.
E-7-142	A	16	13	16	15	would air transport not be affected? (Silvia Llosa, ISDR System)	The point is about freight transportation.
E-7-143	A	16	22		50	Figure 7.2, triangular graphic showing reduced and increased comparative advantage could be more dramatic for clarity (even wider at the wide end) (Dana Coelho, University of Maryland)	We prefer this visualization.
E-7-144	A	16	55			Lines 62-65: Consider the following: '... tourist flows: nationally (Agnew and Viner 2001, Hamilton 2005); by destinations (Belle 2005); by attractions, such as national parks (Jones 2006); by tourism activities (Perry 2004, Jones 2006); or by sector, such as ski tourism (Elasser 2002, Fukshima 2003, Hamilton 2003).' (Dana Coelho, University of Maryland)	Would change the meaning of the text.
E-7-145	A	16				line 64-65 - there are some recent studies on the ski industry that provide insights into adaptation that some of the cited publications do not. Some possible references to add here include: (1) Scott, D., McBoyle, G., Mills, B., Minogue, A.* (2006). Climate change and the sustainability of ski-based tourism in eastern North America. Journal of Sustainable Tourism, 14 (4), 376-398; (2) Scott, D., McBoyle, G., Minogue, A.* (in press 2006) The implications of climate change for the Québec ski industry, Global Environmental Change; (3) Scott, D. and McBoyle, G. (in press 2006) Climate change adaptations in the ski industry: a typology of response options. Mitigation and Adaptation Strategies to Global Change. (Daniel Scott, University of Waterloo)	Space constraints only permit one exemple here; see cross-references.
E-7-146	A	16				line 64 - 'Perry 2004' is not in the bibliography and knowing this reference, does not need to be added here (Daniel Scott, University of Waterloo)	Added.
E-7-147	A	16				line 62 (note this spead sheet would not allow me to list line 62 in the 'from line' column) - the Agnew and Viner 2001 reference is unsuitable for the 'consequences for international tourist flows', as it says little specific about this (and nothing empirical in terms of magnitude of change or timing) and is largely speculative	Discussion of these issues in previous drafts of the chapter had to be deleted because of chapter length limitations.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						(i.e., it is not in any way grounded in known climate-tourism relationships, nor does it consider the many supply or demand side adaptation options). The IPCC needs to move beyond this and cite quantified impact statements. The 'Hamilton et al. 2005' reference, while somewhat controversial in terms of methods (see comment by Gossling and Hall in most recent online volume of Climatic Change), it is suitable a suitable reference for the type of impact identified here. (Daniel Scott, University of Waterloo)	
E-7-148	A	17	1	17	14	This paragraph is weak and requires rewording. It's not clear when it is talking about snow sports and when it is not. (Jean Palutikof, Met Office)	Modified.
E-7-149	A	17	2			northern' => 'high latitudes'? (Jean Palutikof, Met Office)	Modified.
E-7-150	A	17	3			northward' => 'poleward' (Jean Palutikof, Met Office)	Modified.
E-7-151	A	17	4			Why exclude conditions related to snow? (Jean Palutikof, Met Office)	Modified.
E-7-152	A	17	16	17	30	one of the indirect effects on tourism includes spatial extension and amplification of water and vector-borne diseases (Silvia Llosa, ISDR System)	Modified.
E-7-153	A	17	17			The 'Sasidharan et al. 2001' reference is largely speculative and does not provide any empirically grounded research on how climate induced (or otherwise) landscape change might alter tourism perceptions of a landscape or their desire to visit such a location. Other studies do so in a mountain and coastal environments and provide better references for this point: (1) Richardson, R., Loomis, J. 2004. Adaptive recreation planning and climate change: a contingent visitation approach. Ecological Economics 50, 83–99. (2) Scott, D., Jones, B.*, Konopek, J.* (in press 2006) Implications of climate and environmental change for nature-based tourism in the Canadian Rocky Mountains: A case study of Waterton Lakes National Park. Tourism Management (3) Braun, O., Lohmann, M., Maksimovic, O., Meyer, M., Merkovic, A., Messerschmidt, E., Riedel, A., Turner, M. 1999. Potential impact of climate change effects on preferences for tourism destinations: a psychological pilot study. Climate Research 11, 247–254. (4) Uyarra M., Cote I., Gill, J., Tinch, R., Viner, D., Watkinson, A. 2005. Island-specific preferences of tourists for environmental features: Implications of climate change for tourism-dependent states. Environmental Conservation 32(1), 11–19. (Daniel Scott, University of Waterloo)	Modified. Cross-references Chapter 14, which cites some of these references.
E-7-	A	17	20			Suggest to add to phrase ending with "considered by some tourists as positive",	Modified.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
154						although it can bring risks in health condition (e.g. the appearance of tropical diseases in the Southern Mediterranean costs). (Vereczi Gabor, World Tourism Organization (UNWTO))	
E-7-155	A	17	22			Climate change can represent both constraints and opportunities at tourism destinations. The balance of costs and benefits can be illustrated by the situation in the Arctic, where a longer summer season might benefit cruise tourism and activities such as whale-watching, but shorter winters could reduce the range of Arctic fauna and flora which attracts some visitors. (UNWTO, 2003, Proceedings of the 1st International Conference on Climate Change and Tourism, Djerba) (Vereczi Gabor, World Tourism Organization (UNWTO))	Addressed by the chapter.
E-7-156	A	17	30			Suggest to add to the last paragraph: Among the small, tourism-oriented nations Small Island Developing States (Chapter 16) are specially sensitive to climate change impacts, considering that their high vulnerability couples with low levels of adaptation capacity, both considering ecosystems and society. (World Tourism Organization, 2006, Climate Change Adaptation in the Tourism Sector of Small Island Developing States, pilot projects in Fiji and Maldives, project documents prepared for the Global Environment Facility) (Vereczi Gabor, World Tourism Organization (UNWTO))	Mentioned in several places in the chapter, with a cross-reference to Chapter 16.
E-7-157	A	17	34			Is it possible to be more precise in these references to Chapter 14 and Chapter 11, and give section numbers. (Jean Palutikof, Met Office)	Done.
E-7-158	A	17	36	17	38	This sentence isn't about tourism - why is it here? (Jean Palutikof, Met Office)	Modified.
E-7-159	A	17	36		38	This sentence, while referring to tourism in the Arctic, seems out of place and could be relocated or removed. (Daniel Scott, University of Waterloo)	Modified.
E-7-160	A	17	40	18	54	The insurance part has now become very unspecific with rather general arguments, because parts of it were removed to other locations of the document. The removal makes sense; the remaining part is however rather unsatisfactory! I am missing for eg the nice introduction of the previous draft (p.21 l.34, "because the insurance market acts as an integrator (...)", the paragraph on page 22 (also first draft) lines 30-44 ("The central principle of insurance concerns diversification (...)") as well as the potential impacts on the different lines of business). These themes are crucial to the subject. I am also missing the link between insurance availability and prevention/protection. The story is not only about insurance withdrawal but goes hand in hand with protection/prevention measures. In many cases an object remains insurable if appropriate measures are taken.	Modified. Also see the relevant part of the adaptation section later.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						(Pamela Heck, Swiss Reinsurance Company)	
E-7-161	A	17	40	18	46	Some of the better known work is not cited here eg by Dlugolecki, ABI, CII, Mills. (Andrew Dlugolecki, University of East Anglia)	Space limitations, combined with a tendency of this literature to extrapolate pessimistically from relatively little data. One reference added.
E-7-162	A	17	40	18	46	Given the impact on insurers of Katrina, as described in Box 7.4, it is surely relevant to mention points eg relating to difficulty of claim-handling, post-event litigation, etc (Andrew Dlugolecki, University of East Anglia)	Mentioned in the Katrina box.
E-7-163	A	17	44	17	45	I don't understand the text beginning 'and this perspective' to end of sentence. (Jean Palutikof, Met Office)	Rewritten to clarify.
E-7-164	A	17	44			Change "in leadership to warn" to "by statements from reinsurers warning" (Kai Lee, Williams College)	Changed.
E-7-165	A	17	47	17	48	Box 7.2 does not exemplify the point being made here about national insurance schemes, particularly floods, but is a narrower case study of hurricanes and risk financing, and in fact Andrew was not a flood-dominated event like Katrina in 2005. Better cases are in fact related to floods eg Netherlands and UK 1953, but also Australia and USA, (but not Hurricane Andrew). Box 7.2 exemplifies how the private insurance industry can adapt to greater risk, and so is still relevant, but not in the sense given. (Andrew Dlugolecki, University of East Anglia)	The placement of the box is not directly related to the sentence in the text that it follows.
E-7-166	A	17	48			Is this statement about the role of major floods true outside North America? I would not expect it to hold even in Europe. (Jean Palutikof, Met Office)	Generally true for Europe as well.
E-7-167	A	18	1			Change "premium" to "premiums" (Kai Lee, Williams College)	Plural not required.
E-7-168	A	18	2			What does "cyclical" mean? (Kai Lee, Williams College)	Deleted.
E-7-169	A	18	4	18	9	Define more clearly what government risk protection means. Does it include risk financing and prevention, or just financing? Generally, insurers expect government and clients to do risk prevention. It would be useful to quantify how "limited" the risk financing is in terms of insurance in developing countries- easily obtained from Munich Re or Swiss Re. (Andrew Dlugolecki, University of East Anglia)	Clarified.
E-7-170	A	18	6	18	7	The clause "unless ..roles" seems redundant. (Andrew Dlugolecki, University of East Anglia)	Deleted.
E-7-	A	18	12	18	23	the impact of the 2005 hurricanes is not described! should be something like "the	Short summary of 2006 experience added.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
171						losses were well absorbed, new capital (appr 18 bn USD) was quickly raised, the large global players performed better than mid-sized, strongly specialized companies (5 insolvencies in the reinsurance sector)". And the impacts "refine underwriting approach and risk models to take into account the increased hurricane activity in the North Atlantic and the better understanding of storm surge risk, take better into account exposure-related elements (eg demand surge) and man-made factors (eg flood defence management and quality of levees and dams)" see "CRO Briefing, Emerging Risk Initiative - Position Paper, Climate Change and Tropical Cyclones in the North Atlantic, Caribbean and Gulf of Mexico". (Pamela Heck, Swiss Reinsurance Company)	
E-7-172	A	18	12	18	23	one cannot compare the loss figures as they are not all indexed to the SAME year! and additionally are not comparable as such: loss of one hurricane in 1992 against Florida only loss of 4 hurricanes in 2004 against US/Mexico loss of all hurricanes in 2005. Please use same reference, eg all hurricane losse of one year on the whole insurance market. (Pamela Heck, Swiss Reinsurance Company)	Have included a 2005 exposure adjusted estimate for Andrew.
E-7-173	A	18	14			consider just using "billion" instead of sometimes Bn (Dana Coelho, University of Maryland)	OK.
E-7-174	A	18	26	18	27	Please give also the reason for the price increses: RISK ADEQUATE RATES - in order for the sector to remain viable the premiums must reflect the actual losses. The sentence now gives the impression that the reinsurance industry can raise prices whenever it feels like. (Pamela Heck, Swiss Reinsurance Company)	Clarified.
E-7-175	A	18	26	18	33	I am not happy at all with this paragraph. What is your statement? what do you want to state with "loaded for unrecognized and unquantified sources of losses"? Please also note that the paragraph starts with reinsurance and ends with insurance; the layman will not make the difference and associate 2004 also as the most profitable year for the reinsurance industry. It must be removed or rewritten (see also my first comment)! (Pamela Heck, Swiss Reinsurance Company)	Removed. Clarifications added elsewhere.
E-7-176	A	18	26			reinsurers (Dana Coelho, University of Maryland)	Done.
E-7-177	A	18	26			Change "reinsures" to "reinsurers" (Kai Lee, Williams College)	Done.
E-7-178	A	18	29	18	29	A significant factor for reinsurance loadings on premiums is the underlying variability in the incidence of extreme events. Since insurance and reinsurance contracts are generally 12 months in duration, the effect of abnormally high (or	Discussion of reinsurance loadings remover edited.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						low) disasters in any year creates major distortions in revenue flow, and requires a safety buffer for the possibility of adverse conditions. (Andrew Dlugolecki, University of East Anglia)	
E-7-179	A	18	37	18	39	This is not well worded. Most sectors of the investment community do not get involved in any meaningful way with these sectors. These activities (hydroelectric..construction) are specialised or relatively small in relation to manufacturing and services.Some investors and public sector finance would be affected definitely. (Andrew Dlugolecki, University of East Anglia)	Modified to decouple the issues.
E-7-180	A	18	39	18	39	"the last of these" is unclear, but if it means the construction sector , it is definitely wrong. Clarify. (Andrew Dlugolecki, University of East Anglia)	Clarified.
E-7-181	A	18	39	18	40	"tha last of these is sometimes used as an offsetting hedge by insurers against catastrophe losses" can you please give evidence for this? (Pamela Heck, Swiss Reinsurance Company)	Modified.
E-7-182	A	18	43	18	43	I do not think "significant" is the right term, in relation to the scale of impacts, or the scale of their investments. (Andrew Dlugolecki, University of East Anglia)	Changed.
E-7-183	A	18	46			Year is required for this reference which is not in the reference list. (Jean Palutikof, Met Office)	Added.
E-7-184	A	18	46			Cited source appears to be missing from bibliography. (Kai Lee, Williams College)	Checked.
E-7-185	A	18	48	19	16	This section is written very much from a North American standpoint. I'm not sure that the wet/dry distinction (p. 19 l. 10) applies outside North America (effect of drought in Africa, windstorm in Europe). (Jean Palutikof, Met Office)	Section edited.
E-7-186	A	18	48			somewhere is this section I suggest that mention be made that there are interactions between impacts on sectors and that a negative impact in one sector often negatively impacts another sector. For example, flooding impacts water supplies and waste water management. Similarly, positive adaptation actions in one sector generally have positive impacts in another sector. For example, flooding management will protect water supplies, etc. This therefore requires taking an integrated approach to infrastructure impact and adaptation analysis. (Paul Kirshen, Tufts University)	Point added. Thank you.
E-7-187	A	19	1			remove "and" before fire (Dana Coelho, University of Maryland)	Edtied.
E-7-	A	19	6			Two sources appear in bibliography; which is intended in this citation?	Fixed.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
188						(Kai Lee, Williams College)	
E-7-189	A	19	8	19	11	This deserves some references. Also I am not convinced it is right. The dry event of 2003 in Europe, drought, killed over 40,000 people (note the standard figures given are incorrect), and destroyed crops and forests. On the other hand the wet event of Katrina in 2005 disrupted energy markets globally for months. (Andrew Dlugolecki, University of East Anglia)	Edited.
E-7-190	A	19	14	19	16	I would not call post-event investemnt in emergency services an impact. (Andrew Dlugolecki, University of East Anglia)	Edited.
E-7-191	A	19	16	19	16	add 'and disaster risk reduction' after 'emergency services' (Silvia Llosa, ISDR System)	Edited.
E-7-192	A	19	20	19	29	Why only drinking, cooling systems and garden watering were pointed as factors that increase water demand? The highest increase in water demands is observed e.g. in agriculture and various technological processes in industry (Krzysztof Blazejczyk, Institute of Geography and Spatial Organization, Polish Academy of Sciences)	These are exemples cited in the referenced study.
E-7-193	A	19	20	20	24	In my opinion another important impact can arise in arid and semiarid regions after air temperature increase and precipitation no change or lowering - the decrease of runoff and soil moisture can cause significant increase of ground water and river water mineralisation and pollution. (Milan Lapin, Faculty of Mathematics, Physics and Informatics, Comenius University)	See Chapter 3.
E-7-194	A	19	24			suggest having it read "regional water supply systems" (Paul Kirshen, Tufts University)	Edited.
E-7-195	A	19	24			rural-urban migration or migration more generally from drier to wetter regions? The out-migration could also be an issue for the social infrastructure. (Dana Coelho, University of Maryland)	Edited.
E-7-196	A	19	25	19	25	add 'and quality' after 'availability' (Silvia Llosa, ISDR System)	Considered.
E-7-197	A	19	25	19	26	A key supply problem will be the absence of meltwater, particularly in South America and Asia. (Andrew Dlugolecki, University of East Anglia)	Point added. Thank you
E-7-198	A	19	27		29	Consider instead: "And climate change could damage the system itself, problems resulting from flooding as well as erosion of pipelines by unusually heavy rainfall, river flows or storm surges." (Dana Coelho, University of Maryland)	Edited.
E-7-199	A	19	27			consider instead of "including": "causing" or "leading to" (Dana Coelho, University of Maryland)	Only one of a number of possible impacts.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
E-7-200	A	19	28	19	29	I don't understand this distinction between heavy rainfall and flooding. (Jean Palutikof, Met Office)	Deleted.
E-7-201	A	19	28	19	28	Another cause of impacts is drought, which can damage the supply sysytem also. (Andrew Dlugolecki, University of East Anglia)	Space limitations preclude adding further exemples.
E-7-202	A	19	34			Chapter 3 doesn't really have anything on variations with seasona nd time of day, to my recollection - is it possoble to give sections? It's most imporatnt that you check all these references to other chapters are really valid. (Jean Palutikof, Met Office)	Cross-reference deleted.
E-7-203	A	19	36	19	36	Is resiliency the proper term here or is it sensitivity since one is talking about small changes in mean values of parameters such as temperature and precipitation? (Philippe Crabbé, University of Ottawa)	Edited.
E-7-204	A	20	11	20	16	The decrease of annual and seasonal precipitation totals during the last 100 years occurred also in Slovakia and in other parts of central and SE Europe (Published in: Balajka, J, Lapin, M., Mindas J., Princova, H., Stastny P., Szamesova, J., Thalmainerova D. (2005): The 4th Slovak National Communication on Climate Change, Slovak Ministry of the Environment, Bratislava 2005, 138 pp., http://unfccc.int/resource/docs/natc/slknc4.pdf (Milan Lapin, Faculty of Mathematics, Physics and Informatics, Comenius University)	Edited, but space constraints limit additions.
E-7-205	A	20	11			Delete 'Moreover' (Jean Palutikof, Met Office)	Edited.
E-7-206	A	20	18			Delete 'In addition' (Jean Palutikof, Met Office)	Edited.
E-7-207	A	20	33	20	33	Same comment as the preceeding one. Can we talk of the resiliency of stabilization ponds? (Philippe Crabbé, University of Ottawa)	Changed.
E-7-208	A	20	42			Section 7.4.2.3.3: would air transport not be affected by strong winds and storm events (disruption, delays...) (Silvia Llosa, ISDR System)	Not considered as significant as ground effect.
E-7-209	A	20	44	21	38	In northern regions a lot of roads, railways, airports and settlements are constructed of on active permafrost layer. Observed climate warming reduces stability of permafrost and cause damage of transport infrastructure and settlements (e.g. northern airports in Canada, railways and roads in Siberia). Possible climate changes can accelerate process of damage and increase the costs of exploitaton. Possible influence on humans (accidents, colapsts) can be also expected. (Krzysztof Blazejczyk, Institute of Geography and Spatial Organization, Polish Academy of Sciences)	Covered in Chapter 15.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
E-7-210	A	21	4	21	6	Insert 'in Europe' and in Table 7.3 caption (Jean Palutikof, Met Office)	Table deleted.
E-7-211	A	21	11			Provide monetary value also in US\$? (Dana Coelho, University of Maryland)	Done.
E-7-212	A	21	19			Displacement of power loss? (tornadic wind - impact) (Dana Coelho, University of Maryland)	Table deleted.
E-7-213	A	21	27			Risks to what? (Jean Palutikof, Met Office)	Deleted.
E-7-214	A	21	32	21	32	add 'lightening' after 'winds'. Does the report address the effects of climate change on lightening? (Silvia Llosa, ISDR System)	Not specifically addressed by climate change projections.
E-7-215	A	22	5			Please provide references to these case studies. (Jean Palutikof, Met Office)	Added.
E-7-216	A	22	6			The comment that "little synthesis" has been done of the case studies might be amplified here, building on an ecosystem-services perspective. Much of the supply of ecosystem services in a settlement is public in character: the provision of a service carries with it many external effects (e.g., exposure to waterborne illness is decreased by better drainage and sewers; diversion of water from a stream affects the ability of downstream users to use the stream). When climate change leads to a decision to alter the way ecosystem services are provided (e.g., building defenses against sea-level rise, or drilling wells to compensate for lowered streamflow), the external effects of those choices are likely to spur conflict. The underlying dynamic is that most ecosystem services are appropriated in unregulated commons: the price of water taken from a stream reflects the cost of diversion and distribution, not the value of the water to competing users (including non-human ones). Climate change thus has the general effect of stimulating tragedies of the commons, the conflict that results, and the institutional reconstruction required. Other forces, notably economic development and the human migrations stimulated by development, have similar impacts, but the commons problems should be noted in this context. (Kai Lee, Williams College)	Edited.
E-7-217	A	22	10			you might add metro Boston to that list -especially since referred to in several other places (Paul Kirshen, Tufts University)	Done.
E-7-218	A	22	15	22	15	I do not think this definition of "near-coastal" is a helpful one. It is too broad, since coastal impacts are normally felt within 5 kilometres eg Katrina. (Andrew Dlugolecki, University of East Anglia)	Definition widely used: see, for instance, McGranahan, Balk, and Anderson, 2006.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
E-7-219	A	22	22	22	29	References are needed for Mexico City and Sao Paulo (Jean Palutikof, Met Office)	Done.
E-7-220	A	22	26			reference for Sao Paulo? (Dana Coelho, University of Maryland)	See above.
E-7-221	A	22	26			Citations needed for Mexico and Sao Paulo. (Kai Lee, Williams College)	See above.
E-7-222	A	23	12	23	12	this is too minor a mention of the meltwater effect. (Andrew Dlugolecki, University of East Anglia)	Cross-referenced to Chapters 1, 12, and 13.
E-7-223	A	23	12			This reference to Chapter 13 should now be replaced by a reference to Chapter 1, Box 1.1, the Chacaltaya Glacier, since Ch 13 have removed their figure. (Jean Palutikof, Met Office)	Cross-referenced to Chapters 1, 12, and 13.
E-7-224	A	23	14	23	18	extreme weather events also create conditions for disease outbreaks (Silvia Llosa, ISDR System)	Done.
E-7-225	A	23	15	23	15	replace 'pollution' by 'quality' to take account of dust, wildfires and increase in pollen and soil molds concentrations (Silvia Llosa, ISDR System)	Done.
E-7-226	A	23	16			consider: "water- and vector-borne diseases" (Dana Coelho, University of Maryland)	Done.
E-7-227	A	23	17		18	consider removing "health attacks and" (Dana Coelho, University of Maryland)	Done.
E-7-228	A	23	23		26	Consider a slight re-wording: "The problems in London and Chongqing are mainly due to air pollution and fog; Lanzhou and Mexico City are primarily due to air pollution that cannot be dispersed because the cities are surrounded by mountains; and Buenos Aires and Sao Paulo result from extensive pollution from heavy industry." (Dana Coelho, University of Maryland)	Sentence deleted.
E-7-229	A	23	32			"UHIs" (Dana Coelho, University of Maryland)	We used the UHI abbreviation.
E-7-230	A	23	34			Use UHI abbreviation. (Jean Palutikof, Met Office)	Done.
E-7-231	A	23	35			consider instead: "their health, labour productivity, and leisure activities..." (Dana Coelho, University of Maryland)	Done.
E-7-232	A	23	40		42	Consider instead: "Rosenzweig et al. (2005) found that climate change based on down-scaled GCM projections would exacerbate the New York City UHI by increasing baseline temperatures and reducing local wind speeds." (Dana Coelho, University of Maryland)	Done.
E-7-	A	23	46	23	47	I am not convinced that "the ultimate importance of climate change impacts" is	Climate change is not the only stress on

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
233						only in conjunction with other stresses. Europe 2003, Katrina 2005 are 2 cases where the event itself was so massive that other stresses were minor-they may have exacerbated the effects, but they were only secondary to the climatic cause. I think this gives a wrong message, that climate change is only a secondary risk. (Andrew Dlugolecki, University of East Anglia)	human settlements; it generally coalesces with other stresses. Katrina is in fact an example rather than an exception.
E-7-234	A	23	50	23	50	add 'political' to 'economic inequity'; environmental degradation and globalization could also figure in the list (Silvia Llosa, ISDR System)	Done.
E-7-235	A	24	2			remove "fixed and" (Dana Coelho, University of Maryland)	Done.
E-7-236	A	24	4			remove "everywhere" (Dana Coelho, University of Maryland)	Unnecessary.
E-7-237	A	24	6		7	replace "mixes in with" with "will accompany" (Dana Coelho, University of Maryland)	Done.
E-7-238	A	24	6			Insert "in" before "developing" (Kai Lee, Williams College)	Done.
E-7-239	A	24	6			insert "in" ... "especially the case in developing..." (Dana Coelho, University of Maryland)	Done.
E-7-240	A	24	11			section 7.4.2.5 does not point to the disruption of social networks and solidarity by extreme weather events and repeated lower impact events, which reduces resilience. It is known that disasters affect school attendance, increase violence and criminality, gender imbalance and solidarity, divert money from adaptation or risk reduction to emergency response. (Silvia Llosa, ISDR System)	Comment addressed.
E-7-241	A	24	13	24	14	this introduction is unclear. (Andrew Dlugolecki, University of East Anglia)	Redrafted.
E-7-242	A	24	13	25	16	Frequent severe frosts are reported in Northern Asia. In some regions (e.g. Siberia) they destroy central heating system in the cities. Such conditions affect destruction in settlement infrastructure. Every year hundreds of lives are reported. (Krzysztof Blazejczyk, Institute of Geography and Spatial Organization, Polish Academy of Sciences)	Refers to current conditions rather than to climate change effects.
E-7-243	A	24	17	24	18	The grammar should be "if..then.." (Andrew Dlugolecki, University of East Anglia)	Paragraph deleted.
E-7-244	A	24	17	24	23	if possible one or two examples from developing countries should be added to balance the paragraph (Silvia Llosa, ISDR System)	Paragraph deleted.
E-7-	A	24	17	24	17	add 'or droughts' after 'floods'	Paragraph deleted.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
245						(Silvia Llosa, ISDR System)	
E-7-246	A	24	17			insert "As" before "Severe storms..." (Dana Coelho, University of Maryland)	Paragraph deleted.
E-7-247	A	24	18	24	26	The impact of climate change on lower economic classes should be addressed through the G7 and the promotion of incentives for investment in cleaner technologies. (James Bero, BASF)	Discussed earlier in the Chapter.
E-7-248	A	24	20	24	20	However it could be noted that losses and damages can be significantly reduced by proactive disaster risk reduction strategies. (Silvia Llosa, ISDR System)	See 7.6.5.
E-7-249	A	24	26		30	This section seems overly vague, consider something along the lines of the following: "For instance, climate change can influence the economic competitiveness of other regions through the loss and creation of local jobs and population migration from impacted areas into unaffected areas. One indirect impact of particular concern in some areas is the effect on city life, local economies, and family budgets of climate change mitigation initiatives" (Dana Coelho, University of Maryland)	Section redrafted, with additional references.
E-7-250	A	24	28	24	31	If mitigation policy effects are to be discussed, it should be in a separate paragraph, not with indirect impact effects. (Andrew Dlugolecki, University of East Anglia)	Disagree.
E-7-251	A	24	33	24	37	would it be appropriate to mention the very existence of some SIDS in the context of migration (Silvia Llosa, ISDR System)	A matter for the Health chapter.
E-7-252	A	24	39	24	43	This is expanded on page 25 lines 28-46. make that text a box related to this paragraph. (Andrew Dlugolecki, University of East Anglia)	See Box 7.3.
E-7-253	A	24	42			consider moving the phrase "those most dependent on public support" before the list of groups beginning with "especially the poor..." (Dana Coelho, University of Maryland)	Paragraph redrafted.
E-7-254	A	24	48	24	48	replace 'emergency preparedness' by 'disaster risk reduction' (Silvia Llosa, ISDR System)	Done.
E-7-255	A	25	12			interruptions? This seems more like "interruptions in service" which would be an opportunity cost as alluded to later in the bullet point. Consider removing word. (Dana Coelho, University of Maryland)	Paragraph redrafted.
E-7-256	A	25	18		19	Vulnerabilities seem to vary systematically with income level. See McGranahan et al, The Citizens at Risk (Earthscan, 2001). Poor cities face environmental problems at the household level; extreme events such as storms or drought can inflict harm	We strongly agree with this point and have included references to support it.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						on a large population that does not have the capacity to rebuild. Rich cities can take significant risk-reduction measures, such as building levees, while continuing high economic output -- and thus continuing to drive climate change. Rapidly industrializing cities have unsolved environmental problems at the metropolitan scale (e.g., inadequate sewers, poor air quality) that may expose them to climate-related risks (e.g., epidemic waterborne illness, health threats from prolonged atmospheric inversions). Taking protective measures in a context of rapid growth and rising income may or may not be possible (as shown by the uneven situation playing out in Chinese cities). The headline might be "poor cities suffer climate-related environmental problems; rich cities cause them." Of course, we are not suggesting that IPCC make so bald a statement, but the idea of variation among income groupings can nonetheless be documented and used here. (Kai Lee, Williams College)	
E-7-257	A	25	23			"and their actions can affect the poor as well." The actions of the rich negatively affect the poor? (Dana Coelho, University of Maryland)	Yes, see Adger et al. 2005.
E-7-258	A	25	28	25	46	This is closely related to Page 24 lines 39-43. Put it in a box. (Andrew Dlugolecki, University of East Anglia)	Comment addressed.
E-7-259	A	25	28	25	38	in addition to coping mechanism, efforts exist to build disaster resilient communities that could be acknowledged. Among the adaptation mechanisms, add 'livelihood diversification' and 'relocation'. (Silvia Llosa, ISDR System)	Comment addressed. "Livelihood diversification" includes relocation: see Eakin 2006.
E-7-260	A	25	31			climate change-related... add "-" here and elsewhere before "related" for consistency (Dana Coelho, University of Maryland)	Done.
E-7-261	A	25	37	25	40	Consider switching order of last two sentences, then all of the negative impacts are grouped and "on the other hand" can be used for the one positive impact in the paragraph. (Dana Coelho, University of Maryland)	Not considered necessary.
E-7-262	A	25	37			consider just "Low-lying island nations are also threatened." (Dana Coelho, University of Maryland)	Done.
E-7-263	A	25	40	25	46	the problem is also that populations in informal settlements are less likely to be reached by early warnings and therefore evacuated and covered by disaster risk management measures, which results in increased property loss and casualties. (Silvia Llosa, ISDR System)	Lack literature to support this point.
E-7-264	A	25	50	25	51	consider just "vulnerabilities to climate change as one related aspect of a larger multi-stress context" and remove last phrase after colon	Paragraphs redrafted.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						(Dana Coelho, University of Maryland)	
E-7-265	A	26	0			Box 7.3 is too academic. It considers the present, where indeed climate change is just one of many influences. The key issue is what about the future, when climate change will become much more serious, and potentially a dominant cause of migration. This may be happening already in the Pacific and Indian Oceans for small islands. (Andrew Dlugolecki, University of East Anglia)	Lack references to support such a statement.
E-7-266	A	26	1	26	29	Box 7.3. In drought regions (e.g. Sahel, Somali, east Africa) great seasonal and temporal migration is observed in relation to environmental agent, i.e. lack of rains and water. It arises several social, economical and political consequences. (Krzysztof Blazejczyk, Institute of Geography and Spatial Organization, Polish Academy of Sciences)	Same as above.
E-7-267	A	26	1	26	30	box 7.3 this box omits recurrent natural disasters as a major factor of migration especially in countries like Bangladesh and India (Silvia Llosa, ISDR)	Same as above. See box for a reference to the literature on the Bangladesh experience.
E-7-268	A	26	13	26	21	Two items c. (Jean Palutikof, Met Office)	Addressed.
E-7-269	A	26	14	26	15	The migration might well be permanent, depending on how severe the climate change is. (Jean Palutikof, Met Office)	Addressed.
E-7-270	A	26	20			remove "such" (Dana Coelho, University of Maryland)	Stylistic preference.
E-7-271	A	26	21			consider revising to: "there is no agreed-upon definition of an 'environmental migrant.'" (Dana Coelho, University of Maryland)	Same as above.
E-7-272	A	26	32	26	40	This paragraph needs tidying up. (Jean Palutikof, Met Office)	Done.
E-7-273	A	26	48	26	49	The importanxce of slow onset events is ignored eg sealevel rise, absence of meltwater, drought due to lower precipitation/greater evapotranspiration (Andrew Dlugolecki, University of East Anglia)	Change made.
E-7-274	A	27	1	27	5	consider, for consistency with other paragraphs in this section, something along the lines of: "Vulnerabilities of particular geographic areas, such as coastal and riverine areas vulnerable to flooding, or continental locations where changes affect livelihoods of populations living at the margins of subsistence or near major ecological zones that may undergo significant shifts" (Dana Coelho, University of Maryland)	Change made.
E-7-	A	27	3			consider "livelihoods, the most vulnerable of which are likely..."	Edited.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
275						(Dana Coelho, University of Maryland)	
E-7-276	A	27	6	27	7	consider: "Vulnerabilities of particular populations with limited resources for coping with and adapting to climate change impacts" (Dana Coelho, University of Maryland)	Change made.
E-7-277	A	27	8	27	9	A key sector is water supply. (Andrew Dlugolecki, University of East Anglia)	We do not consider this a sector; see infrastructure.
E-7-278	A	27	11	27	12	consider: "All of these concerns can be tied to both direct and indirect effects through interconnections between systems (such as flooding and health) and between locations." Include in following paragraph? (Dana Coelho, University of Maryland)	Prefer the current wording.
E-7-279	A	27	15	27	16	redundant, delete "often related to magnitude and rate of climate change" (Dana Coelho, University of Maryland)	No, needed here.
E-7-280	A	27	16	27	17	consider just: "limited access to financial, human and institutional resources necessary to cope with change." (Dana Coelho, University of Maryland)	Prefer the current wording.
E-7-281	A	27	16	27	16	add 'technical' after 'financial' (Silvia Llosa, ISDR System)	Added.
E-7-282	A	27	18			consider "segments of the population affected" (Dana Coelho, University of Maryland)	Added.
E-7-283	A	27	19			delete "very" (Dana Coelho, University of Maryland)	Very is appropriate.
E-7-284	A	27	21			"settlements" instead of "settlement" (Dana Coelho, University of Maryland)	See chapter title.
E-7-285	A	27	23	27	25	for parallel structure consider the following: "Interactions between climate change and urbanization: Especially in vulnerable areas (i.e. coastlines) and in developing countries, rapidly growing cities approach possible thresholds of sustainability." (Dana Coelho, University of Maryland)	Some changes made.
E-7-286	A	27	23	27	23	"global" is not a good descriptor. Urbanisation is happening globally, but there are important differences regionally in extent and form (Andrew Dlugolecki, University of East Anglia)	Deleted.
E-7-287	A	27	23		35	These bullets are not well supported by the text that comes before it in the chapter. What is a "threshold of sustainability" (l. 25) and how can one defend a "very high confidence" judgment about it? Where is the discussion of how "the globalized economy becomes less resilient" (l. 33) and how does that square with the discussion of scale and vulnerability (p. 12, ll. 27-39)? (Kai Lee, Williams College)	Earlier sections strengthened.
E-7-	A	27	27	27	30	for parallel structure consider the following: "Interactions between climate change	Considered in editing.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
288						and economic growth: Relevant stresses are linked to impacts on resource supplies and waste management, as well as impacts of climate change response policies, which could affect future development paths through higher fuel costs." (Dana Coelho, University of Maryland)	
E-7-289	A	27	29	27	30	This is a gross and misleading simplification- "cheap energy" is only so because the real, but future, environmental costs are not charged to users. The development obtained in that way would be unsustainable, so it is a false argument that economic growth would be prejudiced by charging the correct price. There might be short-term gains, but only at the expense of later and greater damage. (Andrew Dlugolecki, University of East Anglia)	The development literature disagrees.
E-7-290	A	27	29	27	30	Authors should expand on the topic of impacts of response policies - it will be very interesting for the AR4 audience of policymakers. (Jean Palutikof, Met Office)	Considered earlier in the chapter, and we agree -- but other reviewers disagree!
E-7-291	A	27	31	27	35	for parallel structure consider the following: "Increasingly strong and complex global linkages: Interregional trade patterns and migration (among other aspects of society) will be impacted, often in indirect and unanticipated ways, as impacts of climate change cascade through an expanding network of interactions within the global economy." (Dana Coelho, University of Maryland)	Edited.
E-7-292	A	27	36	27	39	for parallel structure consider the following: "Fixed physical infrastructures vital to meeting human needs: Infrastructures susceptible to damage from extreme weather events or sea level rise, and those systems already close to being inadequate risk being pushed over a threshold of failure in the face of additional stresses." (Dana Coelho, University of Maryland)	OK as is.
E-7-293	A	27	40	27	43	for parallel structure consider the following: "Interactions with governmental and sociocultural structures: Systems already under stress from other sources of change (i.e. population pressure and limited economic resources) could be come unviable when climate change is added as a further stress." (Dana Coelho, University of Maryland)	Edited.
E-7-294	A	27	41	27	41	political representation and rights to organize' could be added to the list (Silvia Llosa, ISDR System)	Does not seem appropriate here.
E-7-295	A	27	49			"which demand different valuation metrics." (Dana Coelho, University of Maryland)	Demand is not better than need.
E-7-296	A	27	51			delete "very" and "such" (Dana Coelho, University of Maryland)	One change made.
E-7-297	A	28	4	28	44	On l. 13-14, one speaks of "a variety of demographic, social, and economic processes and stresses". One should add "political". The US Corps of Engineers	We consider this to be included in the term "social".

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						largest spendings were in Louisiana but the money went into pork barrel projects because of local politicians (both federal and state). This is well documented in a series of articles in the Washington Post starting September 8 2005 under the pen of Michael Grunwald. There is a whole book devoted to Katrina by R.J. Daniels , D.F. Kittl and H. Kunreuther, "On Risk and Disaster; lessons from Hurricane Katrina, University of Pennsylvania Press, 2006. I think Katrina is a paramount example of the failure of an institutional process and should be documented as such. (Philippe Crabbé, University of Ottawa)	
E-7-298	A	28	9	28	14	can be deleted (Andreas Matzarakis, Meteorological Institute)	Related to WG II cross-cutting case study of mega-delta vulnerabilities.
E-7-299	A	28	16			replace "in population" with "people" (Dana Coelho, University of Maryland)	Edited.
E-7-300	A	28	17			replace "Its area is" with "The city and its surroundings are" (Dana Coelho, University of Maryland)	Edited.
E-7-301	A	28	20			consider: "urban development has increased settlement and altered land use patterns in areas vulnerable to flooding." (Dana Coelho, University of Maryland)	Edited.
E-7-302	A	28	24	28	25	Isn't the interesting part of the story the build from a category 1 storm in Florida to the category 5 storm in Louisiana across the warmer gulf waters? (Dana Coelho, University of Maryland)	Not especially relevant here.
E-7-303	A	28	26			Begin sentence with "Seventy" rather than "70" (Dana Coelho, University of Maryland)	Edited.
E-7-304	A	28	27	28	28	"More than 1100 people died in Louisiana, nearly all deaths related to flooding and concentrated among the poor and elderly." (Dana Coelho, University of Maryland)	Considered, but not changed.
E-7-305	A	28	33	28	34	"to fund residential flood claims" (Dana Coelho, University of Maryland)	Same as above.
E-7-306	A	28	34	28	36	"In New Orleans alone, flooding of residential structures caused \$8-10Bn in losses, nearly half of which were uninsured. Between 34,000 and 35,000 homes had no flood insurance, including many outside of designated flood risk zones." (Dana Coelho, University of Maryland)	Same as above.
E-7-307	A	28	38		42	Citations needed for factual assertions in this paragraph. (Kai Lee, Williams College)	Reference added.
E-7-308	A	28	38		39	Change "storm damage..." to "storm damage to the Gulf region's oil and gas industry raised vehicle fuel prices..." (Kai Lee, Williams College)	Edited.
E-7-	A	28	39	28	39	Aviation fuel prices were also affected to the extent that 2 airlines filed for	Space constraints preclude addition here.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter- Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
309						bankruptcy protection! (Andrew Dlugolecki, University of East Anglia)	
E-7-310	A	28	40	28	40	delete "have" (Andrew Dlugolecki, University of East Anglia)	Edited.
E-7-311	A	28	40			replace "drove" with "driven" (Dana Coelho, University of Maryland)	Edited.
E-7-312	A	28	40			Change "drove" to "driven" (Kai Lee, Williams College)	Edited.
E-7-313	A	29	0			Table 7.4. The item on drought does not adequately cover the issue of meltwater ceasing as inland glaciers disappear- a major risk for South America and Asia. (Andrew Dlugolecki, University of East Anglia)	Table totally redone.
E-7-314	A	29	0			Maybe Table 7.4 would look better as landscape? (Andrew Dlugolecki, University of East Anglia)	See above.
E-7-315	A	29	1	30	1	Table 7.4. The serious impact of saline intrusions is observed in Amu-Daria valley and Aral Sea. The reduction of water flow in Amu-Daria river caused disturbances at cotton plantations and in cotton industry. Additionally, reduction of water flow has changed coast line of Aral Sea and damage the fishing industry in the region. (Krzysztof Blazejczyk, Institute of Geography and Spatial Organization, Polish Academy of Sciences)	See above.
E-7-316	A	29	1		2	table 7.4. Suggest to add services in the title to climate change impacts on human settlements, energy and industry, as the all the factors in the table affect services, especially tourism. (Vereczi Gabor, World Tourism Organization (UNWTO))	See above.
E-7-317	A	29	2			table, col 2 row 6: add paren after 7.4.2.3 (Dana Coelho, University of Maryland)	See above.
E-7-318	A	29	2			table, col 2 row 3: consider instead "death, injury and displacement" (Dana Coelho, University of Maryland)	See above.
E-7-319	A	29	2			Table 7.4: Temperature: change on tourism to "tourism and recreation" (Andreas Matzarakis, Meteorological Institute)	See above.
E-7-320	A	29	2			Table 7.4: Heat or cold waves: insert: in groups, ..., very young, sick people, ... (Andreas Matzarakis, Meteorological Institute)	See above.
E-7-321	A	29	2			Table 7.4: Heat or cold waves: change internal to "indoor" (Andreas Matzarakis, Meteorological Institute)	See above.
E-7-322	A	29	2			Table 7.4: Heat or cold waves: Change "Effects on human health (morbidity, mortality) (Andreas Matzarakis, Meteorological Institute)	See above.
E-7-	A	29	2			table 7.4: food and livelihood security should be explicitly mentioned. In	See above.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
323						developing countries they are also significantly at risk from natural disasters. (Silvia Llosa, ISDR)	
E-7-324	A	29	2			In cell at intersection of "major storms..." and "projected future...", insert "on" before "settlements" (Kai Lee, Williams College)	See above.
E-7-325	A	30	1			if table is split across pages in final version, header should appear on second page (Dana Coelho, University of Maryland)	See above.
E-7-326	A	30	6	32	44	For insurance costs of climate change, please refer to Swiss Re, 2006, "The effects of climate change: Storm damage in Europe on the rise". If you need additional countries than in the figure "Expected increase in annual loss in Europe", we can provide the full picture. (Pamela Heck, Swiss Reinsurance Company)	Reference added, thanks. But see a survey of different European windstorm model results in the Europe chapter, which show a range of different outcomes.
E-7-327	A	30	6			Section 7.5: sections rests still too much on extreme events that at best weakly connect to climate change and do not allow for any statistically meaningful findings (similar remark was made to the FOD) (Tom Kram, Netherlands Environmental Assessment Agency)	Limited to reporting literature that currently exists.
E-7-328	A	30	8		18	This paragraph is needed earlier in the chapter (perhaps in a shorter form) in the discussion of the importance of vulnerabilities on p. 11 before l. 20. (Kai Lee, Williams College)	Given space limitations and chapter organisation, we think it belongs here.
E-7-329	A	30	16	30	18	However, adaptation means that the cost of a single extreme, occurring in isolation, will be greater than the costs of an extreme which occurs, for example, as the fifth in a string. So maybe this isn't such a good guide to costs. (Jean Palutikof, Met Office)	Edited.
E-7-330	A	30	24	30	25	The reduction of permafrost as the reason of processes pointed in this line should be pointed. (Krzysztof Blazejczyk, Institute of Geography and Spatial Organization, Polish Academy of Sciences)	Added.
E-7-331	A	30	24	30	26	the 'loss of livelihoods means and cultural landmarks' could be added (Silvia Llosa, ISDR System)	Added.
E-7-332	A	30	24	31	1	These impacts are not necessarily related to climate change and are mainly due to changes in the permafrost thermal regime, strength characteristics and also thawing related to construction activities (land clearance etc) and operation of the infrastructure. The damage to these structures is mainly due to the failure to adequately consider the presence of permafrost in the engineering design and the changes in its condition that occur in response to construction activities and presence/operation of the infrastructure. It is not fair to attribute these impacts unequivocally to climate change and Chapter 15 clearly points this out. Note that	Edited.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						reference is made to ACIA (2004) which appears to be a meeting document rather than the actual ACIA report published in 2005 (which underwent rigorous review). The ACIA report (2005), specifically ch 16 on infrastructure does not make similar statements as those that appear in IPCC ch 7 and is more in agreement with those found in IPCC ch 15. (Sharon Smith, Natural Resources Canada)	
E-7-333	A	31	5	31	9	confusing run on sentence (Dana Coelho, University of Maryland)	No change needed..
E-7-334	A	31	11	31	11	add 'and cultural value' (Silvia Llosa, ISDR System)	Changed.
E-7-335	A	31	20	31	20	capacities of local institutions to cope with the resulting stress is one side of the coin but the level of disaster risk reduction measures is the other side that influences costs. (Silvia Llosa, ISDR System)	Added.
E-7-336	A	31	20	32	3	I am sure there are bigger impacts on GDP than those quoted here eg Gurenko of World Bank has written on this, also Freeman. China is affected significantly by extreme events, and Katrina in USA probably amounted to 2% of US GDP, so the costs here look too low. (Andrew Dlugolecki, University of East Anglia)	Must stick to documentation available.
E-7-337	A	31	21	31	22	References needed for El Nino and Hurricane Mitch (Jean Palutikof, Met Office)	OK.
E-7-338	A	31	29	21	45	would be helpful to indicate on graph when hurricane Mitch and the drought(s) occurred (Dana Coelho, University of Maryland)	Would have to redo figure.
E-7-339	A	31	47			Fig 7.3 - please provide Source for this figure (Jean Palutikof, Met Office)	OK.
E-7-340	A	31	51	31	52	Number of box (7.4.) is luck in parathesis. (Krzysztof Blazejczyk, Institute of Geography and Spatial Organization, Polish Academy of Sciences)	OK.
E-7-341	A	32	0	33		we offer the following for consideration in relation to the introductory part of this section: Even though databases on vulnerabilities and populations at risk are now more readily available, this has not necessarily led to appropriate disaster reduction strategies in these areas. Ideally development activities in risky areas should be subject to a mandatory risk assessment to determine to what extent the development project (especially utilities and infrastructure) increases or decreases the risk of the population to natural disasters and climate change. (Silvia Llosa, ISDR)	Chapter length constraints to do not permit this addition, although we agree with the point.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
E-7-342	A	32	0	33		Emphasize/state the important distinction between adaption to gradual climate change and preparedness for extreme weather events. While building designs and standards may be an adaptation to gradual climate change, preparedness for sudden abrupt weather events requires readily available funds and resources to aid a population struck by natural disaster. The role of government in these two cases is quite different, a point that should be developed in the text. (Kai Lee, Williams College)	Idea added.
E-7-343	A	32	3			Cited source appears to be missing from bibliography. (Kai Lee, Williams College)	Added.
E-7-344	A	32	5	32	5	Delete "has" (Philippe Crabbé, University of Ottawa)	Not found on line 5.
E-7-345	A	32	5			delete "has" (Dana Coelho, University of Maryland)	Same as above.
E-7-346	A	32	11	32	12	...disruptions of industrial and domestic activity, especially for the poor... (Dana Coelho, University of Maryland)	No change needed.
E-7-347	A	32	13	32	14	The cost of extending pipelines is considerable, especially if it necessitates relocation of water treatment works. (Dana Coelho, University of Maryland)	Same as above.
E-7-348	A	32	18			delete "anyway" (Dana Coelho, University of Maryland)	Edited.
E-7-349	A	32	30	32	33	I think this is exaggerated. The "prospect" of ACC is remote, and so is not a "particular concern". In fact Hulme dismisses the effect of the THC shutting down as manageable. (Andrew Dlugolecki, University of East Anglia)	Edited.
E-7-350	A	32	31			consider "in many places" instead of "in many settlements and societies" (Dana Coelho, University of Maryland)	Related to chapter title.
E-7-351	A	32	35	32	44	Recent interesting work of P. Hallegatte (Ecological Economics) on the importance of frequency of extreme events vis-a-vis limited capacity available to repair damages in between is missing. Suggest to add this (Tom Kram, Netherlands Environmental Assessment Agency)	Added.
E-7-352	A	32	40	32	43	In fact already the cost of particular events has exceeded 25% for some small nations, so this is VERY HIGH CONFIDENCE, and is an understatement. (Andrew Dlugolecki, University of East Anglia)	We prefer to be cautious.
E-7-353	A	32	47	33	38	Livelihoods research by Prabhir Vishnu of All India Disaster Mitigation Institute with support from ProVention under Applied Research Grant has identified the following issues correlated with risk reduction: recovery after disasters accelerates with livelihood support; accelerated recovery helps victims escape, rather rapidly	Considered in revising the adaptation section.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						but not completely, from exposure to a wide range of risks; escaping risk reduction consolidates when livelihood recovery is sustained; and demand for risk reduction increases among victims once recovery is made sustainable with livelihood support. (Silvia Llosa, ISDR)	
E-7-354	A	32	49			"challenges to adaptation" not "adapt" (Dana Coelho, University of Maryland)	Disagree.
E-7-355	A	32	51	21	51	should 'socially-induced' be added to 'self-induced'? (Silvia Llosa, ISDR System)	Self can refer to voluntary local action.
E-7-356	A	32	51	33	2	Is it the place in this chapter to characterize the various forms of adaptation in general? This needs to be done earlier in an introductory chapter. (Philippe Crabbé, University of Ottawa)	In chapter 17; reference added.
E-7-357	A	33	11	33	11	either replace 'emergency preparedness' by 'disaster risk reduction' because the former is too restrictive or use 'disaster risk reduction including emergency preparedness'; add 'sustainable livelihoods strategies' to the list (Silvia Llosa, ISDR System)	This wording is simpler and more direct.
E-7-358	A	33	11	33	12	delete sentence "one example..." (Dana Coelho, University of Maryland)	Disagree.
E-7-359	A	33	12	33	12	replace 'disaster preparedness' by 'disaster risk reduction' because it is broader and encompasses disaster preparedness (Silvia Llosa, ISDR System)	Same as E-7-357.
E-7-360	A	33	12	33	13	"Systematic emergency preparedness at the community level..." (Dana Coelho, University of Maryland)	The reference is more specifically to disaster preparation.
E-7-361	A	33	15	33	15	you may consider adding the following two publications from UNISDR in the list of references. 'Living with risk: a global review of disaster risk reduction initiatives' and 'Know risk' which bring forward examples of promising cross-cutting adaptation measures and good practices, including improved planning, better regulatory mechanisms and innovation in development and environmental protection activities. Examples worth considering include flood-prone areas of Bangladesh and Assam, Bihar and Orissa, where poor women and men have enhanced their incomes and saved their families by undertaking practical measures to reduce risk, thanks to high levels of awareness and motivation among communities. (see Oxfam Trust India, 2005, Aditi Kapoor) (Silvia Llosa, ISDR System)	Added. Thanks.
E-7-362	A	33	15			1979 or 1999? (Dana Coelho, University of Maryland)	1979 is correct.
E-7-363	A	33	51			Insert 'role' (Jean Palutikof, Met Office)	Accepted.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
E-7-364	A	33	51			Insert "role" after "important" (Kai Lee, Williams College)	Accepted.
E-7-365	A	34	8			Identify in what country the New Brunswick-Prince Edward Island bridge is. (Dana Coelho, University of Maryland)	Done.
E-7-366	A	34	17	34	23	This is a very narrow view of the adaptations that businesses will have to make should climate change occur. The changes businesses will have to make to respond to government regulation and changes in consumer preferences will be much more significant. The TAR recognized this (WG II, Section 7.3.4, Pg. 401) and if it does nothing more, AR4 should acknowledge that the TAR conclusion is still valid. (Lenny Bernstein, L.S. Bernstein & Associate, L.L.C.)	Sentence adited.
E-7-367	A	34	49			Insert 'to' (Jean Palutikof, Met Office)	Already there.
E-7-368	A	34	49			"likely also to be" (Dana Coelho, University of Maryland)	Done.
E-7-369	A	35	10			from' => 'to' (Jean Palutikof, Met Office)	Done.
E-7-370	A	35	10			Change to "...required for reduced carbon..." (Kai Lee, Williams College)	Done.
E-7-371	A	35	10			"required to reduce carbon..." (Dana Coelho, University of Maryland)	Done.
E-7-372	A	35	16			Suggest to add at the end of the paragraph: Compared to certain industries and in agriculture, the use of climate and wheather information in service sectors is rather limited. Fopr example in Fiji a recent project developed specific wheather and climate information products for the sugar cane industry, but in the climate-sensitive tourism sector this kind of information (e.g. short-term seasonal wheather forecast) is currently very superficially used (World Tourism Organization, 2006). For effective adaptation measures it wil be key to improve cooperation between National Meteorological Services, and authorities and businesses in the services sector, in order to make better use of the available climate and weather information. (Vereczi Gabor, World Tourism Organization (UNWTO))	Not possible due to chapter length constraints.
E-7-373	A	35	25			The following reference discusses examples of all three types of adaptation in a specific tourism sector (international ski industry): Scott, D. and McBoyle, G. (in press 2006) Climate change adaptations in the ski industry: a typology of response options. Mitigation and Adaptation Strategies to Global Change. (Daniel Scott, University of Waterloo)	Numerous similor references cited in Chapter 14.
E-7-374	A	35	33			Suggest to add to the end of paragraph: However, the majority of tourism businesses are micro, small or medium-size enterprises that have very limited	Literature lacking on vulnerabilities of SMEs, which is why a preliminary discussion in the

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						adaptation capacity, access to know how and technologies, especially in developing countries. A study conducted for a pilot project in Fiji on climate change adaptation in the tourism sector revealed that tourism businesses (both larger and smaller operators) had very low level of awareness on climate change issues and its current and potential future impacts on their activities (World Tourism Organization, 2006). In many tourism-dependent countries, climate change factors are not incorporated, or inadequately addressed in tourism policies and strategies. In the Fiji project, one of the key objectives is to integrate climate risk factors in the national tourism policy framework, as part of a broader national risk-management strategy (e.g. linked with the National Disaster Risk Management Plan). (Vereczki Gabor, World Tourism Organization (UNWTO))	ZOD was deleted. Awareness mentioned.
E-7-375	A	36	2	37	4	This section addressed an earlier comment of mine on FOD satisfactorily (Philippe Crabbé, University of Ottawa)	Good.
E-7-376	A	36	8	36	28	I'm not sure how this relates to adaptation. How does insurance support adaptation? Surely the only connections between insurance and adaptation are (i) that people may choose to buy insurance where earlier they did not and (ii) insurance companies may change their practices. (Jean Palutikof, Met Office)	Insurance should be a messenger by which people discover the nature of their risk and learn how risk is changing, and in some areas it has rewarded people for taking measures to reduce risk. Therefore insurance can play a key role in incentivising adaptation.
E-7-377	A	36	21			Delete 'that' (Jean Palutikof, Met Office)	OK.
E-7-378	A	36	21			Delete "that" (Kai Lee, Williams College)	OK.
E-7-379	A	36	28	36	28	The following could complete the paragraph: 'Initiatives exist to address questions such as the relevance of weather-indexed insurance to protect farmers' income, improve their risk profile and enhance access to credit in the context of vulnerability to climate variability and change (see TERI). As part of disaster reduction planning, insurance is introduced, where the first installment is paid by an NGO. Group insurance also exists. Another source of information on existing initiatives is the Red Cross climate change center. Insurance of houses, assets and lives of poor people at risk from cyclones in eastern Andhra Pradesh and floods in Orissa are successful instruments to help people live with recurring disasters and sudden ones (Oxfam trust India 2005, Aditi Kapoor). (Silvia Llosa, ISDR System)	Comment summarized but cannot find a reference to substantiate further.
E-7-380	A	36	36	36	39	This is technical language beyond the AR4 readership - please simplify. (Jean Palutikof, Met Office)	Simplified.
E-7-	A	36	50		51	Change to "flood insurance was withdrawn... alternative houses were abandoned..."	Some houses have become abandoned.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
381						(Kai Lee, Williams College)	
E-7-382	A	37	1	37	5	The adaptation given here demonstrates that government intervention is not required! (contrary to the preceding text).The writer needs to tie the logics more closely. (Andrew Dlugolecki, University of East Anglia)	Clarified.
E-7-383	A	37	13	37	17	Is it the place in this chapter to characterize various definitions of resilience without ever referring to its social dimensions? This needs to be done earlier in an introductory chapter. (Philippe Crabbé, University of Ottawa)	See glossary.
E-7-384	A	37	19			"indicates a need" instead of "indicates needs" (Dana Coelho, University of Maryland)	Changed.
E-7-385	A	37	32	37	41	Could profit from wider evidence than the UK focussed examples given. E.g. the Netherlands experience with using regional climate scenarios in planning of coastal and river defense systems. (Tom Kram, Netherlands Environmental Assessment Agency)	Not possible due to chapter length constraints..
E-7-386	A	38	6			Meaning of "more sustainable city" is unclear. From context, meaning seems to be a city in which greenhouse gas emissions reductions are instituted. This is not the same as the (loose) meaning of "sustainable" in other contexts (e.g., environmentally responsible development, according to proponents of green design). (Kai Lee, Williams College)	Addressed.
E-7-387	A	38	8			change: .. that can reduce not only heat island effects (Andreas Matzarakis, Meteorological Institute)	Done.
E-7-388	A	38	10	38	19	another interesting example to assess and cite is the Beddington Zero Energy Development (see www.bedzed.org.uk) (Silvia Llosa, ISDR System)	Done.
E-7-389	A	38	11			Insert 'for' (Jean Palutikof, Met Office)	Done.
E-7-390	A	38	11			Insert "in" before "GHG" (Kai Lee, Williams College)	Done.
E-7-391	A	38	11			"developing countries is a GHG mitigation issue" (Dana Coelho, University of Maryland)	Done.
E-7-392	A	38	13			The European Directive on energy efficiency in buildings, see Chapter 6, motivated by Kyoto etc considerations, significantly influencing codes. (Geoff Levermore, Manchester University)	Done.
E-7-393	A	38	13			Insert "of" before "zoning" (Kai Lee, Williams College)	Done.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
E-7-394	A	38	15			Change 'consideration' to 'strategies' (Jean Palutikof, Met Office)	Done.
E-7-395	A	38	18	38	19	BASF regards modern coal power plants as an important pillar of a future energy strategy, therefore we cannot support the statement as written. Renewable energy sources (solar, wind, and hydroelectric) are viable sources of energy, but only in limited geographic areas. They will meet only a small percentage of the overall energy demand over the next 50 years. (James Bero, BASF)	No consensus in the scientific literature on this point.
E-7-396	A	38	21	38	22	It would be more appropriate to re-write the sentence as following: "Models have been established to predict the impact of urban thermal property manipulation strategies resulting from albedo and vegetation changes (Akbari et al. 1997) and urban form manipulation (Emmanuel, 2005)." (Rohinton Emmanuel, University of Moratuwa)	Done.
E-7-397	A	38	31		38	Policy responses and planning decisions can also be hampered by the failure to coordinate across relevant professional disciplines. For example, the growing importance of urban planning that integrates vegetation planning with other more architectural and engineering solutions in offsetting heat islands and increasing livability under climate change (Ch 7, p 38, lines 5-19), argues for a broader role for landscape architects and urban foresters in planning at all spatial scales (Benson and Roe, 2000). Reference: Benson, J.F., and M.H Roe. 2000. The scale and scope of landscape and sustainability. Chapter 1 in J.F. Benson and M.H. Roe (eds.), Landscape and Sustainability, Spon Press: London. (Stephen Sheppard, University of British Columbia)	Done.
E-7-398	A	38	31			Additional adaptation strategies specifically suited to developing cities could be mentioned here (incl. non-motorized urban transportation, air quality enhancement, etc.) (Rohinton Emmanuel, University of Moratuwa)	Lack research literature for support.
E-7-399	A	38	42	38	44	Please provide an example. (Jean Palutikof, Met Office)	Done.
E-7-400	A	38	43			Meaning of "going beyond their own borders" is unclear, since most settlements draw upon ecosystem services from hinterlands beyond their jurisdictional boundaries. (Kai Lee, Williams College)	Addressed.
E-7-401	A	38	43			"by going beyond their borders" - Physically through migration of the acquiring of resources, or in search of social capital and/or adaptation ideas? (Dana Coelho, University of Maryland)	Addressed.
E-7-	A	38	47			Social issues: "Community-based disaster risk management (CBDRM)" has long	Addressed.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
402						<p>term benefits in creating community assets and capacity to face sudden and slow onset disasters. This is practiced successfully in countries such as Phillipines, Bangladesh and India. A key factor is that governments allow a democratic implementation of such strategies. Equally important is education related to environmental issues that includes education on risk reduction. As climate change covers gradual changes observed over long periods of time, educating children would create increased options for citizens to consider local solutions in their own specific environments. The Decade for Education for Sustainable Development (DESD) provides a unique opportunity to further develop this concept (see The Challenge of Global Empowerment : Education for a sustainable future. Author: Dr. Daisaku Ikeda. www.sgi.org).</p> <p>Information issues: Most marginalized communities suffer from a lack of information suited to their needs. Real time information including early warning, monitoring of weather information has led to greater resilience locally (see for example the concept of Village Knowledge Centres along the coastal regions of Tamil Nadu, India at www.mssrf.org).</p> <p>Opportunities in Post-disaster recovery : Every disaster provides an opportunity to "build back better". In areas known for recurrent natural disaster, post disaster recovery strategies should be aimed at building community resilience. The scope of the intervention therefore needs to be enlarged to encompass mitigation strategies, education and knowledge transfer.</p> <p>(Silvia Llosa, ISDR)</p>	<p>Addressed.</p> <p>Addressed.</p>
E-7-403	A	39	9	39	15	Inaccessible language. (Jean Palutikof, Met Office)	Paragraph redrafted.
E-7-404	A	39	23			"regulate and distribute critical resources" (Dana Coelho, University of Maryland)	Not clear why this makes sense.
E-7-405	A	39	24			Change "in" to "at" (Kai Lee, Williams College)	Done.
E-7-406	A	39	29			encouraging sustainable "resource" use (Dana Coelho, University of Maryland)	Done.
E-7-407	A	39	42			"migrating" (Dana Coelho, University of Maryland)	Done.
E-7-408	A	39	45			reference for Vietnam example? (Dana Coelho, University of Maryland)	Changed to a different exemple.
E-7-409	A	40	2			remove "including" (Dana Coelho, University of Maryland)	Done.
E-7-	A	40	4			"traditional cultures is the current experience of the Inuit in the Arctic"	Edited.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
410						(Dana Coelho, University of Maryland)	
E-7-411	A	40	4			"current experience" is obscure without mentioning of at least one concrete example. (Kai Lee, Williams College)	Edited.
E-7-412	A	40	7	40	13	the lack of training in risk management including harnessing of surprises and uncertainty' could be added to the 'lack of access to information of decision-makers' (Silvia Llosa, ISDR System)	Addressed.
E-7-413	A	40	7	40	8	"associated with climate change and variation is generally facilitated by effective leadership and the presence of structures for..." (Dana Coelho, University of Maryland)	Sentence deleted.
E-7-414	A	40	10			Current research with local communities in Canada suggests that the lack of information on climate change for decision-makers is exacerbated by the absence of mechanisms and experts in downscaling, interpreting, and communicating the information to decision-makers and their constituencies. (Stephen Sheppard, University of British Columbia)	Lack published references to support.
E-7-415	A	40	10			"difficult challenges occur when" all other "where"s to "when" in this sentence (Dana Coelho, University of Maryland)	Done.
E-7-416	A	40	12	40	12	infrastructure, technological' could be added before 'institutional capacities' (Silvia Llosa, ISDR System)	Done.
E-7-417	A	40	16	41	30	This section is different in tone from the rest of the chapter, and needs an extensive re-write. The language is inaccessible, it strays too far onto the ground of Chapter 17, there are too few references to support the text. Given space constraints, and the value of covering other topics such as the impacts of response measures, authors should consider whether it can be omitted or at least radically shortened. (Jean Palutikof, Met Office)	Rewritten, focusing on Chapter 7 topics.
E-7-418	A	40	16			one issue to be added is the opportunity offered by disasters to rebuild better. In areas where natural disasters recur, post-disaster strategies aim at building community resilience therefore enhancing adaptation. These should include knowledge transfer and sharing. (Silvia Llosa, ISDR)	True, but the focus here is on adaptation to reduce damage, not to recover after the damages have been experienced.
E-7-419	A	40	18		26	This good paragraph belongs (also) at p. 32, before l. 49. (Kai Lee, Williams College)	Thank you, but we think it works better as a summary than as an introduction.
E-7-420	A	40	21			"realistic" instead of "realistically conceivable" (Dana Coelho, University of Maryland)	This usage is more precise.
E-7-421	A	40	28			use "settlements" instead of "communities"? (Dana Coelho, University of Maryland)	OK.
E-7-	A	40	29			"using information in an ad hoc manner to make adjustments"	No, may be more systematic.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
422						(Dana Coelho, University of Maryland)	
E-7-423	A	40	32	40	32	replace 'disaster response' by 'disaster risk reduction' (Silvia Llosa, ISDR System)	We prefer this wording.
E-7-424	A	40	33	40	33	after 'provide' add 'risk assessments and' (Silvia Llosa, ISDR System)	Included in the second item.
E-7-425	A	40	33			"advance warning systems, especially for extreme events" (Dana Coelho, University of Maryland)	Unnecessary.
E-7-426	A	40	34	40	34	after 'structures that' add 'promote public awareness, knowledge development and information sharing,' (Silvia Llosa, ISDR System)	Length constraints work against such elaboration.
E-7-427	A	40	34	40	35	"diversified economic systems" (Dana Coelho, University of Maryland)	Unnecessary.
E-7-428	A	40	35	40	36	"adaptive and locally-based (relative to geography or industry sector) social structures" (Dana Coelho, University of Maryland)	Too complex.
E-7-429	A	40	37	40	37	after 'planning' add 'and environmental management' (Silvia Llosa, ISDR System)	OK.
E-7-430	A	40	37	40	38	"land use planning that is sensitive to climate change vulnerability" (the above recommendations are for parallel structure and clarity (Dana Coelho, University of Maryland)	Does not seem to be better.
E-7-431	A	40	37			Additional text acknowledging the importance of building the constituency for adaptation policy and behaviour change: "...into land use planning for the long term; public outreach and awareness/capacity building on local impacts of climate change; and in some cases physical...." (Stephen Sheppard, University of British Columbia)	Change made.
E-7-432	A	40	46	41	1	"Climate change adaptation strategies are inseparable from increasingly strong and complex linkages within the global economy. Industrial planning, human settlements, and social development are not isolated from changes in systems at other scales. The urban and rural are interconnected, as are developed and developing societies." (Dana Coelho, University of Maryland)	Section substantially rewritten.
E-7-433	A	40	46		47	This sentence is not supported in the earlier text; at minimum, a reference to another chapter is needed. (Kai Lee, Williams College)	See above.
E-7-434	A	40	48			"changes in systems at other scales" (Dana Coelho, University of Maryland)	No, not what the sentence means.
E-7-	A	41	2	41	5	This appears to duplicate some text in the preceding bullet (2)	Section substantially rewritten.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
435						(Andrew Dlugolecki, University of East Anglia)	
E-7-436	A	41	3	41	4	... "adaptation decisions for local activities owned or controlled by external systems involve different processes than those for local activities under local control." (Dana Coelho, University of Maryland)	Edited.
E-7-437	A	41	6			"one of many challenges to human systems managing risk" (Dana Coelho, University of Maryland)	Considered.
E-7-438	A	41	7			delete "for such purposes" (Dana Coelho, University of Maryland)	Unnecessary.
E-7-439	A	41	10			"have considerable potential to become foundations of adaptation responses." (Dana Coelho, University of Maryland)	Prefer current wording.
E-7-440	A	41	12		18	This paragraph is not supported by discussion in the earlier text. (Kai Lee, Williams College)	Section revised.
E-7-441	A	41	16	41	17	"significant adaptive capacity; on the other hand, failing to do so can leave significant gaps that are difficult to fill..." (Dana Coelho, University of Maryland)	OK.
E-7-442	A	41	19	41	23	This bullet on maladaptation introduces material that has not been used in the main text. Discuss it first before using in a summary. (Andrew Dlugolecki, University of East Anglia)	Section revised.
E-7-443	A	41	19			"All adaptation responses are not necessarily optimal." It seems that this option would never be chosen, so this may be a more appropriate statement. (Dana Coelho, University of Maryland)	Section revised.
E-7-444	A	41	24	41	24	Replace "more other" by "side-" (Andrew Dlugolecki, University of East Anglia)	Edited.
E-7-445	A	41	24	41	25	"but may have additional effects." (Dana Coelho, University of Maryland)	Edited.
E-7-446	A	41	24			Delete "more" (Kai Lee, Williams College)	Edited.
E-7-447	A	41	26			"reduced" instead of "reducing" in both instances (Dana Coelho, University of Maryland)	Disagree.
E-7-448	A	41	28	41	30	I don't understand "the benefits of adaptation may not be delayed..."; that they may not be realized at all makes them analogues to insurance; in other words, the fact that the storm of a certain magnitude does not occur does not in any way invalidate the adaptation measure. This connotation is not clear from the text. (Philippe Crabbé, University of Ottawa)	Section revised.
E-7-449	A	41	28	41	28	delete "not" (Andrew Dlugolecki, University of East Anglia)	See above.
E-7-	A	41	28			Delete "not" (after confirming meaning intended)	See above.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
450						(Kai Lee, Williams College)	
E-7-451	A	41	33			Same remark as #13 above: discuss the Hallegatte paper of interest to SD implications. (Tom Kram, Netherlands Environmental Assessment Agency)	Referenced.
E-7-452	A	41	37			"Because climate change, its drivers, impacts and policy responses" (Dana Coelho, University of Maryland)	Prefer current wording.
E-7-453	A	41	51			"loci of mitigation actions and adaptations involving long-term land use and capital investments." (Dana Coelho, University of Maryland)	Same as above.
E-7-454	A	42	3	42	13	I disagree with these conclusions. First the threat of slow onset events is ignored (drought, absence of meltwater supply, sea level rise). Second, while ACC might be a grave problem, the "prospect" of it occurring before 2100 is remotely small. (Andrew Dlugolecki, University of East Anglia)	Edited.
E-7-455	A	42	4	42	8	It seems you are emphasizing physical/geographic vulnerability and vulnerability of fragile social systems, both to extreme, abrupt climate change events. This could be made clearer; as the sentence reads now they appear to say largely the same thing. Consider: "The most serious sustainable development issues associated with climate change impacts on the subjects of this chapter are: 1) threats to vulnerable geographic regions, such as coastal, polar, and dry land areas, as well as low-lying islands; and 2) threats to fragile social systems, both from abrupt, extreme climate change events that could (through their low-probability but high-consequence nature) overwhelm adaptive capacities." (Dana Coelho, University of Maryland)	Edited.
E-7-456	A	42	12	42	13	"Brittle" is not a term I understand, even when supplemented by "rigid and frail". Please give examples or redefine it. (Andrew Dlugolecki, University of East Anglia)	Edited.
E-7-457	A	42	17	42	18	"significance lies primarily in its interactions with other stresses and thresholds, such as..." (Dana Coelho, University of Maryland)	OK.
E-7-458	A	42	31	42	34	consider: "In many cases, actions that increase resilience of industry, settlements, and society to climate change will contribute to development even without climate change, by reducing vulnerabilities to natural climate variation and other stresses and uncertainties." (Dana Coelho, University of Maryland)	We think the current wording is better.
E-7-459	A	42	34	42	34	you may consider adding a comment along these lines: "This makes the case for jump starting adaptation through dynamic disaster risk reduction that is adjustable to further changes in risks and vulnerabilities even stronger. By assessing present	Section revised.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
						climate-related vulnerabilities and extremes to increase resilience, likelihoods of risky development and maladaptation are reduced. (F. Sperling and F. Szekely 2005. 'Disaster risk management in a changing climate'. Discussion paper prepared for WCDR on behalf of VARG www.unisdr.org) (Silvia Llosa, ISDR System)	
E-7-460	A	42	40	45	42	On the other hand, social system inertia may prevent adaptation when change is moderate (e.g. Katrina preceded by other milder hurricanes) (Philippe Crabbé, University of Ottawa)	Incorporated.
E-7-461	A	42	44			we propose the following to complete this section on priority areas for research: <ul style="list-style-type: none"> .. Geographical distribution of vulnerabilities of human settlements and socio-economic conditions at the scale of continents/ sub-continental regions .. National/sub-national vulnerability-poverty assessments (Example : UNDP, VPA Maldives, 1997) .. urban risk assessments .. strategies for public education and awareness of populations at risk, esp children. .. Historical studies of development patterns and their influence on vulnerabilities. Such correlation based studies are rare at present. (Silvia Llosa, ISDR)	Some changes made, but some of this is not sufficiently related directly to climate change impacts.
E-7-462	A	42	44			"Section 7.8: Key Uncertainties and research priorities" The feedback/links between UHI and global climate change needs to be mentioned. Additionally, research on the urban human comfort/health effects of climate change in developing cities need to be encouraged. (Rohinton Emmanuel, University of Moratuwa)	Agree with the thoughts, but given the length constraints we lack room to add a discussion of these issues.
E-7-463	A	42	50	42	51	"2) uncertainties regarding indirect..." (Dana Coelho, University of Maryland)	This is a research priority here.
E-7-464	A	43	0			Discussion of research needs omits consideration of ways that consumption and investment (shaping urban design and transportation systems) alter the context for behavior relating to _driving_ of climate change. It is often asserted, for example, that low-density residential development patterns in rich countries reinforce dependence on automobiles (rather than mass transit). It is unclear why driving effects such as these are not included in the scope of the chapter. (Kai Lee, Williams College)	Good points – but the territory of WG III.
E-7-465	A	43	13	43	16	I think the financial threshold above which climate risks become uninsurable is an important research question as it constitutes a limit to adaptation; this comment was made by me in the previous round and has been insufficiently addressed here. (Philippe Crabbé, University of Ottawa)	Considered, subject to length limitations.
E-7-	A	43	13	43	16	"...the primary impact issue for developed countries is the possibility of abrupt	Both priorities are important.

IPCC WGII AR4 SOD *EXPERT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
466						climate change, which could cause changes too rapid and disruptive to absorb, at least over a period of several decades." Given this statement (slightly edited) why is the first stated research priority about more graduate climate change? (Dana Coelho, University of Maryland)	
E-7-467	A	43	14	43	16	I disagree that ACC is a major concern for developed nations. See eg Hulme of Tyndall Centre, who considered it as manageable if the THC stopped. Two other impacts might be worse- largescale migration from other impacted countries, and repeated large disasters eg hurricanes. On the other hand, rich nations could overcome resource scarcities , even of water. (Andrew Dlugolecki, University of East Anglia)	The chapter authors disagree. We consider this an important point.
E-7-468	A	43	34	43	34	Have tsunami-related DRR interventions had impact on the adaptation capacities of coastal communities to climate change? AIDMI's field work with 1400 families across South India and evaluation work with the Tsunami Evaluation Coalition, Disaster Emergency Committee, and several INGOs and UN bodies show that a major opportunity to understand this link between DRR interventions and adaptation capacities is being missed. (Silvia Llosa, ISDR System)	Yes, that is our point.
E-7-469	A	43	38			while I feel your 'pain' regarding limitations of data, should 'painfully' be reworded or removed ('very serious limitations' - says it clearly) (Daniel Scott, University of Waterloo)	OK.
E-7-470	A	44				Please ensure that all references cited in the text are listed: Reference for Emmanuel, 2005 (in p. 38, line 22): Emmanuel, R., 2005: An Urban Approach to Climate Sensitive Design: Strategies for the Tropics, Spon Press, London (Rohinton Emmanuel, University of Moratuwa)	Carefully checked.
E-7-471	A	48	34	48	37	change "in press" to 2006 (Dana Coelho, University of Maryland)	OK.
E-7-472	A	48	40			whether => weather (Jean Palutikof, Met Office)	OK.