



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

Specific Comments

GOVERNMENT REVIEW COMMENTS

Chapter 16

August 2006

Discussion of Government 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 Govt 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**.

IPCC WGII AR4 SOD *GOVERNMENT* Review Comments

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Notes of the writing team
G-16-1	A	0				Throughout this Chapter the authors need to make it clear that the attribution picture for sea level rise is very complex and is regionally specific. Tectonic plate movements and other geological phenomena can affect sea level around small islands as much as SLR caused by anthropogenic interference with the climate system. This is not adequately addressed in the Chapter and needs to be pointed out clearly, including in the Executive Summary. (Government of Australia)	Attribution is properly a matter for WG1 and is not considered here. In 16.2.2 on observed trends we refer to variability in regional and island records including tectonic movements.
G-16-2	A	0				This chapter is very comprehensive. Nevertheless, it would be very useful if the chapter could better clarify the situation with Tuvalu and prospects for resettlement, perhaps by adding a “box”. This is an important near-term adaptation issue, but policy makers and the public have been presented with contradictory reports that need to be clarified. Several media accounts have stated that Tuvalu s being abandoned, while others suggest that Tuvalu made such a request to Australia, which was denied, and still others suggest that Tuvalu is not planning to abandon its homeland. (Government of USA)	We have added a new section (16.5.4.4.) on emigration and resettlement as an adaptation mechanism, and deal specifically with the Tuvalu situation based on refereed journal articles rather than media and government reports, though these are analysed in the journal articles.
G-16-3	A	0				The chapter mixes ecological, social and institutional impacts of and responses to climate change, without explaining how the different elements interact with one another. (Government of Norway)	The structure of the chapter follows the prescribed template. How some of the different elements interact with one another is Indicated in Box 16.4.
G-16-4	A	0				Each chapter that mentions the SRES scenarios should include a reference to the description in the TS. (Government of USA)	We refer to the original SRES intercomparison (Ruosteenoja et al., 2003) as well as the WG1 report (IPCC, 2007).
G-16-5	A	0				Baltic Sea is not mentioned in the chapter at all, nor its archipelago (Government of Finland)	Clearly it is impossible to consider all areas and islands in this Chapter.
G-16-6	A	0				Although the TAR only dealt with small islands designated as those belonging to Small Island States, we believe that by including small islands that fall outside of the Small Islands States, the AR4 provides a more diverse and comprehensive assessment of small islands around the globe. (Government of Japan)	Agreed. But as indicated in the second paragraph on page 6 of the FGD, the emphasis is still on autonomous small islands.
G-16-7	A	0				Although globalisation encompasses many different processes and potential outcomes (both positive and negative) it is portrayed throughout the chapter as mainly a negative force. (Government of Norway)	The reviewers comment is correct. Our consideration of the refereed literature suggests that the impacts have been and will be mainly negative.
G-16-8	A	0				A comprehensive discussion of the challenges, though utility is somewhat undermined by lack of specific articulation of which islands are at most risk based on geologic setting, etc. Also question some of the adaptation approaches. In many	Regrettably there has not been any comprehensive review of islands most at risk since the SAR. With reference to the last

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						instances, advise small islands that will likely be submerged in the near future to invest in infrastructure that will reduce their CO2 emissions seems misguided. (Government of USA)	sentence see our response to G-16-51 (below).
G-16-9	A	3	3	4	18	Exec summary should have all major points should be bolded; chapter authors are inconsistent and do not follow language regarding uncertainty provided in the introduction (eg. Virtually Certain, Very Likely, etc.), and instead use “will” (or similar wording) that suggest a higher level of certainty than the information provided in the chapter. Therefore, the authors do not use the appropriate terminology when referring to the “degree of confidence” AND “likelihood of occurrence/outcome” in all of the bullet points in the Exec. Summary for this chapter. (Government of USA)	Noted and corrective action taken in re-written ES.
G-16-10	A	3	5		37	Use of term “will be” doesn’t reflect level of uncertainty. The authors should use the terminology prescribed (eg., “ it is virtually certain, very likely, likely, etc.). (Government of USA)	Comment no longer relevant in the context of redrafted ES.
G-16-11	A	3	7	3	9	The authors should confirm that the confidence reading that many islands are already experiencing negative effects of global warming is accurate and that the recent negative effects are simply not due to climate variability. (Government of Australia)	See comment above.
G-16-12	A	3	10	3	12	The reference to war, internal conflict and tourism is confusing in this context, and diverts attention away from the main focus on vulnerability and adaptation to climate variability and change (Government of Norway)	We agree and have corrected this language that was never intended in the first place.
G-16-13	A	3	10	3	10	The authors should clarify whether the low adaptive capacity of small islands is inherent due to their physical nature or due to developmental constraints. (Government of Australia)	We believe that the source/origin of the well-documented low adaptive capacity of most small islands is irrelevant.
G-16-14	A	3	10	3	12	Suggest rewrite of the following sentence: “Small islands have low adaptive capacity and limited ability to recover from natural and man-induced shocks without external assistance, as recently demonstrated by hurricanes and the impact of internal conflicts and war on tourism.” Reasoning: Sounds like small islands have low adaptive capacity as demonstrated by “war on tourism”. (Government of Japan)	Comment no longer applies, given the re-drafted ES.
G-16-15	A	3	19	3	20	The wording is still unclear. The following language is proposed: .., with increases and decreases of more than 10% projected for the 30-year periods 2010-2039, 2040-2069 and 2070-2099 compared to the reference period 1961-1990. (Government of Austria)	See comment above.
G-16-	A	3	25	3	25	The title mixes together 'limits' and 'constraints'. The term 'constraints' is not	We do not understand the sense of the first

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16						clearly understood but presumably refers to the rate at which an adaptation measure proceeds. This idea would be better woven in under the previous two headings, leaving the last section to deal with the idea of a cap on the amount of adaptation which may be feasible. In addition, the authors should explain how sea level rise will compound the threat to small islands of rainfall changes. (Government of Australia)	three sentences, as they show no connection to the text under reference. With respect to the final sentence, the threat to fresh water availability would be compounded because salinity intrusion will cause deterioration of water quality.
G-16-17	A	3	38		39	Language implies that warming alone resulted in extinction. There are many factors that contribute to extinction of a species. This statement should be supported by precise examples in sec. 16.4.4 (currently it is not). (Government of USA)	Accepted. However, this is no longer relevant in the context of the re-drafted ES.
G-16-18	A	3	40	3	43	The authors should consider including a sentence to the effect that adaptation strategies (such as sea walls) may also have a detrimental impact on tourism. (Government of Australia)	We do not believe that this recommendation enhances the text. In any event, it is no longer a major consideration, given the re-written ES.
G-16-19	A	3	47	3	47	The authors should confirm that the confidence reading is high given that only few studies have been conducted. (Government of Australia)	The comment is no longer relevant, in the context of the re-drafted text.
G-16-20	A	3	49		50	Define the term “internationalisation”,. It’s unclear in its usage in this sentence. (Government of USA)	See comment above.
G-16-21	A	4	5	4	8	The authors need to consider whether this dot point more properly comes under the mandate of WG3, or at least, ensure that there is consistency in this finding, with the WG3 report. (Government of Australia)	While we strongly believe that use of renewable energy sources can contribute to the achievement of sustainable development in islands (and is therefore relevant to the chapter), this is no longer an issue, as the ES has been re-drafted.
G-16-22	A	4	12	4	12	Delete "to the achievement of" as this implies that sustainable development is a final goal, rather than an on-going process. (Government of Australia)	We accept, but this is no longer relevant, given the re-drafted ES.
G-16-23	A	4	12		14	This is an absolute statement; it needs to be supported or modified. (Government of USA)	See comment above.
G-16-24	A	5	6	5	12	Lack of emphasis on non-climate factors that contribute to local, relative sea-level rise undermine value of this discussion. (See chapter 6.) Global sea-level rise (even accelerated) may be only a minor portion of total sea-level rise seen at some locations. Policy decisions will be made at a local or regional level, predicted changes in global rates of sea-level rise have limited value at those localities unless other drivers are captured and quantified. (Government of USA)	Noted. We however wish to point out that relevant non-climate factors are dealt with elsewhere in the chapter. The reviewer is reminded that this section is merely a summary of the TAR, which is intended to provide a context for assessing post-TAR findings.
G-16-	A	5	17			Have “all” small islands been forced to reallocate scarce resources? Who forced	Language has been modified.

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25						them? Surely it was their decision. What data substantiates this claim? Many adaptation strategies also benefit economic development and poverty alleviation (e.g., hazard resilience). Author’s phrasing implies that adaptation is always a cost and cannot provide economic or sustainable development benefits, which is false. (Government of USA)	
G-16-26	A	5	21		22	How would the projected rate compare to rise over last 100 years? Also, how variable is relative sea-level rise regionally? Most of these island ecosystems developed in the face of rising sea-level, how much relative change can they tolerate? This will vary by geologic setting. Global sea-level rise (even accelerated) may be only a minor portion of total sea-level rise seen at some locations. Policy decisions will be made at a local or regional level, predicted changes in global rates of sea-level rise have limited value at those localities unless other drivers are captured and quantified. (Government of USA)	This section is intended to be an accurate summary of the TAR only, and is intended to provide a context for assessing post-TAR findings.
G-16-27	A	6	25	6	36	The authors need to more clearly explain the coverage of the Chapter. It is unclear from the treatment whether it includes small islands that are part of larger countries (e.g. Hawaii) or just small island developing states. (Government of Australia)	We draw the reviewer’s attention to page 6, lines 18-22 of the SOD. However, we believe that we have provided even greater clarity in the redrafted FGD.
G-16-28	A	6	44	6	47	The authors should include a confidence finding for the finding that some small islands are at particular risk of climate sensitive diseases, rather than the current confidence finding which (presumably) relates to the few studies that have been conducted on this subject. (Government of Australia)	We do not understand the relevance of the comment , as it seems to bear no relationship to the text under reference.
G-16-29	A	6	45	6	45	comma missing afer the words 'In the tropics' (Government of Mauritius)	Added in FGD
G-16-30	A	6	45		46	What’s the difference between an “extreme weather event” and an “extreme climate event”? (Government of USA)	Similar to the distinction between weather and climate
G-16-31	A	6	46	6	46	suggest 'losses' rather than 'damages' (Government of Mauritius)	Accepted and changed in FGD
G-16-32	A	7	5		7	What is meant by “accentuating climate change regimes?” Clarify or use different terminology. (Government of USA)	Our text says ‘accentuating climate regimes’ not ‘climate CHANGE regimes’
G-16-33	A	7	8		25	What’s the point of this discussion? Doesn’t really seem to set up following discussion as I didn’t see any subsequent discussion of how these local climatic factors may be influenced in the future. These examples don’t setup the discussion that follows. Directly link them to the rest of the chapter, or remove.	The regional chapter template indicates that the general climate features of the area should be briefly discussed. This section does this, though we agree that the linkage between this

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						(Government of USA)	section and what follows is not explored.
G-16-34	A	8	8	8	10	This is an extremely important and controversial point. Please add references such as Emmanuel 2005. Also include citation for Webster et al. 2005. (Government of USA)	We have included references to Levinson (2005) and Webster et al., (2005)
G-16-35	A	8	17		18	Unclear what the period is referred to when stating the “reliable record” in the North Atlantic – please specify and add reference. (Government of USA)	These words do not appear in the FGD
G-16-36	A	8	17		18	This statement must be updated given the record activity in the North Atlantic in 2005. (Government of USA)	In the revised text in the FGD the statement has been inadvertently omitted.
G-16-37	A	8	21		32	The text needs a figure to point out that the rates of sea level rise have been different in different places, as well as the uncertainty in projections of global sea-level rise into the future. It’s not clear from reading this text that any problem exists. (Government of USA)	We have not included a figure but have given more examples of the variability in sea level change records in various small island regions.
G-16-38	A	8	38		39	Vulnerability is also a function of negative actions taken by the SIS themselves, such as coral mining, deforestation, poor water management, etc. (Government of USA)	Agreed though this point has not been added in the FGD
G-16-39	A	9	8	9	9	Increasing vulnerability to climate change is an ambiguous statement. It is possible to be vulnerable to impacts of climate change but is it actually possible to be vulnerable to climate change? (Government of Japan)	See previous comment
G-16-40	A	9	14		18	Many of the factors listed aren’t new and have been around much longer than the last few years (e.g., multinational corporations). (Government of USA)	See previous comment
G-16-41	A	10	9	10	9	typing mistake: 'decline' (Government of Mauritius)	Accepted and changes in FGD
G-16-42	A	12	19		36	Discussion of trends in hurricane frequency and intensity doesn’t reflect the ongoing debate in the literature, and presents only one view (e.g., references to Emmanuel’s paper, but not to the many articles that presented counter views). Refer to WG1 section on the observed changes in tropical cyclone frequency/intensity, and other recent relevant articles should also be cited. (Government of USA)	Accepted and deleted the portion, and added text based on WGI AR4.
G-16-43	A	12	31	12	32	This information has not been presented yet (was not mentioned in WGI, either) however it presents a key feature about tropical cyclones. The statement, “However, it is likely that tropical cyclones will last longer in a warmer world and that the number of strong tropical cyclones will increase.” seems to present new	Accepted and deleted the portion, and added text based on WGI AR4.

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						information. Up until now there have been numerous statements about stronger (intensity) tropical cyclones, but WGI was consistent in saying that the frequency (number of) tropical cyclones was not likely to increase (nor is it currently increasing). These statements about cyclone frequency are not consistent and thus require correction. (Government of Japan)	
G-16-44	A	17				Figure 16.1 – Japan is highly concerned about mass bleaching caused by ocean acidification however, Japan is not listed in the islands presented in this figure. Suggest inclusion of Japanese islands. (Government of Japan)	Figure 16.1 in the SOD is not included in the FGD. It has been replaced by Box 16.2 which includes several examples, though none from the Japanese islands.
G-16-45	A	19	20	19	22	First mention of a Japanese island in this chapter so far. However, can Hokkaido really be considered a “small island”? Moreover, the sentence relates to a reported decrease in alpine flora due to climate related ecosystem effects, which seems to be a stretch compared to the other discussion related to small islands thus far (i.e. coastal/beach erosion, fisheries impacts, sea level rise, water resource pressure, etc). (Government of Japan)	The chapter is about small islands (not defined) and not just small island states. Examples from islands outside of the tropics has been encouraged during the assessment process.
G-16-46	A	19	29		30	Are the studies on the impact on sea-turtle nesting sites based on detailed studies of beach response? This may seem like a trivial point, but it illustrates one of the challenges with the selective inclusion of some literature. I doubt seriously that site specific beach process studies utilizing projected changes in relative sea-level rise were conducted. Extrapolating global sea level rise to predict local affects and then aggregating them regionally or globally can lead to spurious results. (Government of USA)	The example is taken from a refereed paper in an international journal.
G-16-47	A	19	32	19	32	Inclusion of Hawaii seems at odds with the rest of the chapters focus on SIDS. (Government of Australia)	The chapter is on small islands and not just SIDS. Moreover, the example deals with highland areas in contrast to much of the literature on small island that has a coastal lowland bias.
G-16-48	A	20	35	20	39	This statement strongly suggests that climate change will likely increase the incidence of vector-borne diseases on small islands. The discussion of this topic in the Human Health chapter however, was inconclusive as to whether disease transmission was influenced by climate change. (Government of Japan)	Noted and corrective action taken in re-drafted section 16.4.5
G-16-49	A	21	13	21	15	States that damage caused by Hurricane Ivan in 2004 set Grenada’s national socio-economic development back by at least one decade. This information is buried in the ULR, while Hurricane Katrina got mention in the SPM. Suggest that the case of	We agree and have emphasized the point in the FGD.

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						Grenada be used as a poignant illustration of the consequences of storm damage, low adaptive capacity/lack of in-country adaptive capacity. (Government of Japan)	
G-16-50	A	21	25	21	25	The notation "EC\$" should be explained. (Government of Australia)	Comment no longer relevant, as box has been modified.
G-16-51	A	22	32		42	Strongly question the wisdom of advocating that small island nations invest their often limited resource in infrastructure intended to reduce their relatively infinitesimal CO2 emissions. Those resources may well be better spent to mitigate effects or even relocate their populations. Strikes as poorly thought through and undermines the credibility of the chapter. (Government of USA)	We take strong exception to the sentiments expressed, especially the last sentence. We also strongly question the wisdom of the comment. We simply wish to say that the authors are of the view that investment in proven renewables (and there are numerous examples in small islands, as indicated in the same paragraph under reference) is not only for the purpose of mitigating "infinitesimal" CO ₂ emissions, but reduces dependence on the importation of costly fossil fuels, saves foreign exchange, and often uses locally available resources. We therefore believe that these initiatives can make a valuable contribution to sustainable development goals.
G-16-52	A	23				Box 16.3: The figure is good in that it illustrates the multitude of factors that affect adaptation and well-being and conditions. However, it is not clear how the graphs are derived and what exactly are they showing. It is not clear either how much the different drivers affect the outcome and what is their relative importance. "Adaptation/changes" are not defined - what kinds of adaptations are needed to reach the "Good" level. (Government of Finland)	The diagram and explanation make the drivers and linkages much clear in the new Box 16.4 in the FGD. The relative importance of the factors will vary between small islands. 'Poor' and 'Good' are not defined but are relative terms.
G-16-53	A	28	43	28	45	These 2 sentences should be deleted as they try to establish a benchmark for DAI, which other chapters of WG2 suggest is a value judgement that cannot be based in science alone. The sentences are, therefore, policy prescriptive. (Government of Australia)	We feel that the first two sentences give the context of the remainder of the quote and without them the quote would be incomplete. We do not agree that the statement is policy prescriptive, certainly not as far as the authors of this chapter are concerned.
G-16-54	A	31	43	33	9	Also include mention of comprehensive understanding of factors contributing to relative sea-level rise, and more comprehensive network of in situ measurement to document it. Global sea-level rise (even accelerated) may be only a minor portion	Accepted. Necessity of more comprehensive network of in situ measurement to understand factors contributing to relative sea-level rise

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						of total sea-level rise seen at some locations. Policy decisions will be made at a local or regional level, predicted changes in global rates of sea-level rise have limited value at those localities unless other drivers are captured and quantified. Which islands are at most risk? (Government of USA)	are mentioned in dot point one of Observations and Climate Change Science.. See
G-16-55	A	31	45	31	47	Delete the sentence which states that small islands can be seen as an early-warning to the world. This statement is overly emotive and fails to recognise other regions (such as polar regions) could also be seen as "early warnings". (Government of Australia)	Accepted. This sentence is not included in the FGD.
G-16-56	A	31	45		47	This sentence is not supported by the chapter or the other chapters in the document. The chapter does not demonstrate that the impacts of climate change are more of a reality to small island inhabitants than to others. In the case of sea level rise, Tuvalu appears to be the most vulnerable island nation—but this report does not demonstrate that it is more vulnerable than deltas or barrier islands. Arctic areas and mountain glaciers may also experience problems before small islands. Finally, the chapter also does not support the sentence that the “adverse consequences of climate change are already a reality.” There is still uncertainty as to whether observed impacts are natural variability or climate change. (Government of USA)	Accepted. The sentence is changed to describe that small islands are sensitive to climate change and variability and some of the impacts are occurring now, which is described in this chapter. We have changed reality to ‘reality’ as well as the sentence within which the word is contained in the FGD.
G-16-57	A	32	10	32	10	The authors should define what a "metropolitan country partner" is. (Government of Australia)	It is changed to “partners”.