



INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE



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NINETEENTH SESSION
Geneva, 17-20 (morning only) April 2002

IPCC-XIX/Doc. 8b
(22.III.2002)

Agenda item: 6.a.ii.IV.
ENGLISH ONLY

**Collated comments on the earlier draft of the Scoping Paper for a proposed
Technical Paper:**

**Levels of Greenhouse Gases Preventing Dangerous Anthropogenic
Interference with the Climate System**

(Submitted by Vice-Chairman Prof. Yuri Izrael)

**GOVERNMENT COMMENTS ON THE DRAFT SCOPING PAPER
FOR THE TECHNICAL PAPER:**

Levels of Greenhouse Gases in the Atmosphere and Dangerous Anthropogenic Interference with Climate System

GENERAL COMMENTS

In my capacity of the IPCC Focal Point for Albania, I would like to express the support of the Ministry of Environment of Albania for the IPCC scoping paper for technical paper titled: “*Levels of GHGs in Atmosphere and dangerous anthropogenic interference with Climate System*”.

We appreciate and hope this as a very good step toward solving the issue of *non-hazardous levels of CO₂ and other GHGs*, for which actually, a certain lack of knowledge exists. We also appreciate your work done in the compilation of this draft scoping paper and the contribution of the other colleagues.

(Tatjana HEMA - Albania)

There is no doubt that the objective of the proposed IPCC Technical Paper is plausible. However, as presented, it would exceed the Panel’s responsibility regarding the policy matters which transpire some of the proposed items. Further, the scoping paper includes concepts which have not yet been defined in the IPCC glossaries. Procedurally-wise, these concepts should not be defined in a Technical Paper. Furthermore, to be more aligned with the text of the UNFCCC Article 2, it would be better to refer to the Concentration Levels of Greenhouse Gases in the Atmosphere. Finally, it is suggested that the Technical Paper should be titled :

**CONCENTRATION LEVELS OF GREENHOUSE GASES IN THE ATMOSPHERE
*Potential Danger of Anthropogenic Interference with the Climate System. Implications***

In fact, since a Technical Paper has to be based in the information available in previous IPCC publications, and as the definition of danger / dangerous is not a matter falling under the IPCC responsibility, the suggested title would provide a better frame for the text that will be taken from the IPCC publications.

(O. Canziani – Argentina)

We have not any remarks and proposals for the draft of Scoping paper for the IPCC Technical Paper

G. Kojoyan – Armenia)

I have no general comments. I would like just to emphasize the importance of preparation of such a Technical Paper because of higher importance of issues considered.

(Martiros Tsarukyan – Armenia)

Australia welcomes the opportunity to comment on this scoping paper, which addresses an important aspect of the global climate change debate. Australia commends the efforts of the drafting team and offers the following comments:

- Australia is concerned that the construct of the scoping paper does not appear to take into account the totality of Article 2 of the UN Framework Convention on Climate Change. The paper appears to be framed around only the first part of the Article, and omits the remainder of the text, namely that *“Such a level should be achieved within a timeframe sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.”* Australia’s view is that any IPCC report in relation to levels of GHG concentrations and anthropogenic interference must also include full consideration of the related issues of timeframes and emissions reduction pathways. The scope and content of the proposed report should therefore be re-designed to better reflect this.
- This subject is one that has attracted considerable controversy in the past as to whether it lies more in the scientific or political domain. The IPCC has, however, made very clear, in its Third Assessment Report Synthesis Report, that, while scientific analysis can provide essential information and evidence, ultimately decisions about what constitutes “dangerous anthropogenic interference” are value judgements determined by sociopolitical processes. [Question 1]
- The approach proposed by the scoping paper is aimed at keeping the assessment as objectively scientific and as scientifically objective as possible. If this objectivity can be maintained, the resulting analysis could make a valuable contribution to our understanding of the potential impact and risks of increasing atmospheric concentrations associated with anthropogenic greenhouse gas emissions, and provide a valuable yardstick to policymakers.
- The narrow line over ownership of this issue, and high sensitivities to what might be construed as policy prescriptive comment, must be recognised in further developing this scoping paper and in the overall approach to this IPCC report. It is important that:
 - all definitions be as clear and transparent as possible, particularly when introducing the concepts of “critical” levels and “thresholds of tolerable risk”;
 - policy-neutral language be used consistently. For example, the term “maximum permissible” levels of GHGs has strong connotations of a policy imperative – suggest something more neutral, such as “assessed high risk”; and
 - that the report be approached in pragmatic and realistic manner, aimed at providing useful scientific guidance to policymakers.
- The scoping paper is predicated on development of an IPCC Technical Paper, without a full examination as to whether this would be the most appropriate approach for the IPCC to take. The IPCC Procedures specify that Technical Papers are to be based solely on material already in existing IPCC reports and modelling studies that were carried out explicitly as part of existing reports. It is not clear from the paper as to whether sufficient material of this nature is available within existing IPCC reports, and in fact there are indications (p3, lines 15-16) that the report would seek to go beyond

existing IPCC material. It is suggested therefore that full consideration be given to whether this issue would be best addressed through a Technical Paper or a Special Report.

- The page allocations to the various sections of the paper seem somewhat unbalanced, given the amount of material and range of issues that are indicated in some of the sections. By far the largest section is Section 7, which is “an example construction of critical levels”. While this is clearly a key deliverable of the paper, it is not clear that 8 pages are warranted based on the extent to which existing IPCC reports can provide the necessary basis for such a construction, without exceeding the mandate for Technical Papers and resorting to non-IPCC material. (Alternatively, this could be reviewed in the context of the preceding comment.)

LEVELS OF GREENHOUSE GASES IN THE ATMOSPHERE AND DANGEROUS ANTHROPOGENIC INTERFERENCE WITH CLIMATE SYSTEM.

In the view of Austria the draft of the scoping paper for a Technical Paper “Levels of Greenhouse Gases in the Atmosphere and Dangerous Anthropogenic Interference with Climate System” addresses a lot of relevant issues and Austria recognizes the considerable effort already made. However, in the view of Austria it is too early to decide upon such an important issue before the UNFCCC workshop on the TAR of the IPCC planned for April 2002 prior to SBSTA 16. This workshop may offer the opportunity for a wide and open discussion on the conclusions of the IPCC TAR and what research and data gaps there might exist from the perspective of the needs of the Convention. In addition the discussion at the workshop might help to clarify the added value of the proposed Technical Paper. Austria expects that this discussion could help to specify the scope of such a technical paper. In addition, Austria would also like to study the ideas of other Parties, which may be included in their submissions due by 15 February 2002.

In the view of Austria the various functions of the climate system (e.g. biospheric function, socio-economic function, climate-forming function) also need further clarification before discussing the draft in more detail.

(Klaus Radunsky – Austria)

A scientific process to help define what constitutes “*a dangerous anthropogenic interference with the climate system*” is a useful task which the IPCC could conduct. As often acknowledged, the definition of the acceptable level is not a pure scientific matter but scientists can help in the process of providing policy makers elements on the possible consequences of different levels of climate change and the effects of policy measures undertaken. Society as a whole should define the level of “danger” it is ready to accept, while scientists should concentrate their efforts on the enhancement of knowledge, reductions of the uncertainties and diffusion of their knowledge to a broad public.

Suggestion:

In section 3.4 (line 16, p.6) it is proposed to study the cause-response relationships between the changes in global climate and changes in GHG content of the atmosphere. I support this proposal and would suggest that beyond the analysis of possible thresholds levels in GHG concentration and the consequences associated with this, some attention could be devoted

to what science has to say about the possibilities of reversibility of these consequences once the thresholds have been exceeded. In other words, are the impacts on the targets reversible? And if so, on which time scale?

I raise this question because it would add an important element to the economic analysis of the need to reduce greenhouse gases emissions. Some authors in the economic literature show that the marginal benefit curve from emission reductions remains rather flat relative to the amount of reductions performed. This result is linked to the stock character of GHG pollutants, to the long time scale of the climate processes and to the high discount rates used in classical economical analysis.

Such a result from economic analysis could be inadequate in the context of climate change and especially within a dynamic system that contains irreversible processes. In order to assess this question, elements from the scientific knowledge on the reversibility of the climate impacts and the time scale required for any reversal would help the process.

With this suggestion, I believe that the outcome of the Technical Paper will help to improve the knowledge on the economic analysis of the problem, as it remains a critical element for policy decisions to be taken.

(Philippe Tulkens - Belgium)

The idea to produce an IPCC Technical Paper about the scientific underpinning of Article 2 of the UNFCCC is good. This article has been there for ten years, and little progress has been made to quantify the GHG stabilization “*level that would prevent dangerous anthropogenic interference with the climate system*”. As mentioned in the TAR Synthesis Report, it is to the policy makers to decide what this level is, not to the scientists, even those as close to the policy making as some participants to the IPCC work are. But scientists may help the policy makers to decide about that level by highlighting the implications of different possible choices for the criteria to be used for that decision, the risks (in different categories) associated with a range of stabilization levels, the uncertainty attached to the results, the decision analysis framework(s) that would be appropriate to help reaching a decision, and the ways to reduce the main uncertainties.

I believe that for the intended Technical Paper to be really useful for the policy makers, it should start from their needs. Short of asking them through a world-wide survey, I suggest that we should start from what we know of their general intention when they adopted, and later ratified the Climate Convention. This is reflected in Article 2 of that Convention, in particular its second sentence *not* quoted on page 2, line 5 to 9 of the draft Scoping Paper: “*Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.*”

By this second sentence, policy makers tell us indirectly what they perceived to be the three most important criteria to be used in assessing the desirable speed at which stabilization should be achieved: 1) natural adaptation of ecosystems; 2) threats to food production; 3) sustainability of development. I suggest that the same three criteria could be used as a starting point in assessing also the “*level that would prevent dangerous anthropogenic interference with the climate system*”.

The notion of “danger” here is not only related to the effects on the climate system *per se*, but must be clearly linked to the human beings and ecosystems that would experience this danger. Using the second part of the Article 2 as a basis for assessing the “non-dangerous level” has already been suggested in Chapter 1 of the WGII contribution to the TAR, and a Technical Paper could usefully explore this idea more extensively. The fundamental questions : “dangerous for whom?”, “dangerous in the eyes of whom, according to which criteria?” should also be addressed fully in the Technical Paper.

The present draft Scoping Paper puts too much emphasis on “targets” which seem to be mostly elements of the climate system. The paragraph on Criteria (page 4, lines 25-29) shows clearly that the reasons why policy makers (or their voters) want to protect the climate system are not given much importance. The precise role of section 4 is not clear to me (the “climate-forming function of the climate system” is apparently already addressed in section 3). In general, the structure of the draft Scoping Paper is difficult to understand, but it may in part be due to the unusual vocabulary used in some instances.

The present draft Scoping Paper gives also too much the impression that scientists are going to solve the problem, and that policy makers will be asked to rubber stamp the scientists’ solution. This is not the role of IPCC. I am not convinced that a Technical Paper drafted along the lines and structure suggested in the present draft Scoping Paper would really help to advance closer to a decision.

However, the issue is very important, and I believe that a Technical Paper drafted with the above considerations in mind would have a better chance to reach its intended target. Given the fundamental criticisms presented here, no additional specific remarks will be made on the present draft Scoping Paper.

(Jean-Pascal van Ypersele - Belgium)

We appreciate the efforts to determine a critical level of GHG in the Atmosphere and support first steps in this direction to win objectivity to fulfill the main objective of the convention. We are in ground agreeing with the scope of the Technical Paper; even we perceive limitations to use current understanding with regards to the adaptive capacity of targets, in particular socioeconomic nature (point 4.2 and 5.5). We would also suggest seeking for a broader definition of tolerable risk, combining perceptions of Annex I and Non-Annex I countries. For us, as a country with high food vulnerability and poverty levels is critical to include indicators that contribute to the perception of impacts and damage upon traditional food systems, and vulnerable economies (and this is the case for a broad spectrum of developing countries).

Other major issue upon we need more accurate results, is the issue of natural hazards and disasters in tropical and subtropical regions, this is not explicit within the TP proposal included in chapter 6.

(Javier Gonzales Iwanciw – Bolivia)

The Government of the Dominican Republic has a general comments in relation to technical paper "Levels of Greenhouse Gases in the Atmosphere and Dangerous Anthropogenic Interference with the Climate System". Considering that it technical paper is very important

because take into consideration news definition and point of view that are no included in the TAR, and will take into account the perspevtive of biospheric function of the climate system.

(Rene Ledesma - Dominican Republic)

(The Comments by China has been submitted by fax, therefore, only conclusion is given here, may by requested to send by fax/ Yuri Izrael). The mandate of IPCC is to provide information for policymakers, but not to make its judgement. Due to above-mentioned reasons, the Chinese Government believes that it is inappropriate to initiate this Technical Paper.

(China)

Generally, we give full support to the idea of Professor Izrael. The topic in the proposed technical paper is highly relevant, and we would like to compliment the authors for their work. Analyses and studies are certainly needed in determining what constitutes dangerous anthropogenic interference with the climate system.

TAR gave valuable input to these questions. However, significant gaps in knowledge, which are acknowledged in the TAR, still exist. Research is active in this field, and decision making is in an increasing manner dealing with various considerations that are necessary in determining how Art 2 of the Climate Convention can be made concrete.

Considering the importance of the topic and the ongoing development in research, we wonder if the preparations of a technical report at this stage might be somewhat premature. Therefore, we propose a step by step approach as follows:

- First, an IPCC workshop on 'Levels of Greenhouse Gases in the Atmosphere and dangerous anthropogenic interference with the climate system' be held in approximately 6-9 months from now. Experts in the field would be gathered to get an update of on-going research and to discuss how best to deal with the questions.
- Second, a plan for action (perhaps for a special report, perhaps something to be dealt with in FoAR) would be presented.

The work could start after the IPCC spring plenary in 2003. Contentwise we restrict ourselves to only very few issues: in doing the work, the IPCC should aim at producing relevant information for considerations of scientific, equity, development and sustainability issues as well as uncertainty and risks (also containing relevant consideratios of cost and damage options).

This work should be coupled with analyses of different stabilization options. Note, that stabilization scenarios are also the topic of ongoing research. The compilation and delivery of a full set of SRES and post-SRES (stabilization) scenarios for use by the impact and adaptation research community is currently being undertaken by the IPCC task group on scenarios (TGCIAs).

(Juha-Pekka Snakin – Finland)

* We suggest use the word "element" or "component" instead of target for naming the recipient of climate change impacts (page 4 and after).

* The definitions of Maximum Permissible, subcritical and critical level should be done in the first line of page 4.

* In the Section 2.4 Major Issues, consider to add another a new 25 line saying:" How to establish the above mentioned level?

(Carlos Mansilla – Guatemala)

(The Comments by Italy has been submitted by fax, therefore, only conclusion is given here, may be requested to send by fax/ Yuri Izrael). However, a carefully drafted paper based on the findings of the TAR could represent a good starting point for such discussion. The paper should focus on the sensitivity of the climate system and of specific natural and human systems affected by climate change, and provide suggestions on methodologies to define critical levels for the most vulnerable systems

Any attempt to define aggregate critical levels of GHG content in the atmosphere should be postponed to a later stage, when an adequate number of ecological and social studies will be available.

We therefore suggest to delete section 7 and to revise accordingly section 8.

(Italy)

The topic of this proposed Technical Paper is definitely very important and should be one of the highest priorities in the IPCC Forth Assessment.

This topic was vigorously discussed in the question 1 of the Synthesis Report (SYR) of the IPCC TAR just a couple of months ago. The SYR concluded at its answer to question 9 that comprehensive and integrated investigations to support the judgement as to what constitutes “dangerous anthropogenic interference with the climate system” were required.

When addressing the topic of the Technical Paper (TP), Japan believes it necessary to take a comprehensive and integrated approach taking into account the various aspects of climate change including emission scenarios, prediction of climatic and environmental change, impact and risk assessments on the environment, economy and society, mitigation and adaptation potentials and policies. In this regard, the proposed approach in the Scoping Paper (SP) seems too inclined to the geophysical aspects of the climate system. A socio-economic, ecological and human dimension approach should be more emphasized.

Considering the current situation in the lack of essential knowledge, it seems too ambitious to attempt to construct critical levels of GHGs content in the atmosphere in the TP.

Therefore, the targets of the TP should be focused upon the consolidation of existing knowledge, the elaboration of possible approaches for eventual construction of critical levels, and the identification of a range of priority works to be done.

The TP should only be developed based on the information available from previous reports approved/adopted by the IPCC. This is a usual practice of the IPCC when developing a TP and review of new literature should be done in the course of developing the Fourth Assessment Report and Special Reports, in accordance with ‘PRINCIPLES GOVERNING IPCC WORK’ approved at the fourteenth session of the IPCC.

In the SP, various terms related to dangerous anthropogenic interference are used. They include “critical level”, “non-hazardous (not-dangerous)”, “hazardous (dangerous)”, “critical limits”, “sub-critical zone”, “maximum permissible level” and “threshold.” Some of the terms and their relationships have not been well defined or discussed in the TAR, therefore, this work should be one of the major aims of the TP. In addition, the concepts of “long-term levels” and “tolerable rate of changes of GHGs” and their implications to climate policy should also be elaborated.

(S. Nagata – Japan)

The general layout of the paper is satisfactory. Emphasis on capturing scientific work that was not included in the IPCC TAR has value added.

The paper’s perspectives are in line with the IPCC main objective of **“assessing the state of existing scientific knowledge on climate system and climate change together with associated environmental and social impacts, and recommend possible response strategies”**. From its outset, it aims at collecting and compiling all findings in the previous IPCC assessment reports, into a single volume and possibly include new findings which are not in the latest assessment report. This is commendable. It will help in exchanging knowledge and information among scientists and policy makers.

General Comments for:

1) Title; page 1, line 22-24:

The title needs to be changed to read: **“levels of greenhouse gases in the atmosphere and their anthropogenic interference with climate system”**. This is because any additional gaseous injection into the atmosphere, irrespective of amount/level, will interfere with the manner in which the global climate system responds naturally.

2) Section 1; Background, page3, line 25:

Let the paper not be limited to the number of pages per section as indicated. The pages for each section may be increased or reduced depending on the material(s) to be presented. This will ensure clarity of information so as to avoid being too brief on one hand and redundant on the other hand.

3) Section 2; page 4, line 10:

The word: “leaves” should be accompanied by direction of departure.

4) Section 2; page 4, line 14-16:

Reconstruct the sentence in these two lines so as to avoid using the word: “sub-critical” in the definition of: “critical value”

5) Section 2.4 Major issues to be considered in the Technical Paper, page 5, line 16:

The sensitivities and adaptive capacities of the targets considered should be region dependent, especially with regard to **fauna and flora**. This needs to come out clearly though, section 5.7 has tried to address the issue.

Line 22

The threshold for tolerable risk, will depend on the element of the biosphere being considered. With regard to **fauna and flora** for example, several thresholds may exist since we have several kinds of these on earth. Ultimate care therefore needs to be taken when defining such thresholds. It is not clear how such a threshold as suggested in this line will be achieved. The phrase: “Tolerable risk”, should therefore be clarified/defined in terms of the probability of its occurrence and the extent of acceptable damage.

Line 32

Modeling approach has been and is still being used in all the IPCC assessment. Many uncertainties surround the models used due to data limitations. It is felt that emphasis should be put on monitoring. The results of the monitoring should be used to verify the **current** model outputs

6) Section 3.3-3.6; page 6, Lines: 14-21

A topic on **vulnerability of ecosystems** should be added before the conclusion. This could come between sub-section 3.4 and 3.5.

Section 6.2; page 8, line 1

The sub-title “climate resources of agricultural and food production” is misleading. I suggest it be changed to: “climate change impacts on agriculture resources and food production.”

7) Section 6.3, page 8: line 3: Forest Resources:

I suggest that bio-diversity be addressed under “**Forest resources**” section. This should include consideration of vulnerable wild animals and plant species. If this is not the case, bio-diversity aspects, especially those relating to wildlife, should be considered as a separate item by themselves.

8) Section 6.5; page 8, line 7

It is understood that there will be more impacts on islands and coastal settlements due to the sea level rise. However, settlements in the interior will also be impacted on. As such the item: “Security of island and coastal settlements” does not capture all human settlements. I therefore propose that the subtitle of this item be changed to read: “Security of human settlements”.

9) Section 7; page 8, Lines 26-32

As indicated in the general comments for page 4, line 14-16, above, it is confusing to define “critical” with the word “sub-critical”. I suggest that different words with same meaning as, “sub-critical” be used instead.

Other sectors which should also be considered in this section include: energy, wildlife and bio-diversity.

(J. G. Wairoto - Kenya)

The topics suggested to be covered in the Technical Paper are relevant and are comprehensive. The real problem will surface when we seriously identifying or defining the levels of GHGs emissions that are considered to be dangerous anthropogenic interference with the climate system. Even if we just consider this issue purely from science’s perspective, we will still be facing difficulty in identifying a universally acceptable definition of a dangerous anthropogenic interference with the climate system. This is because the science of climate change still contains many areas with significant or large uncertainty. We are quite sure scientists will not easily agree on what constitute a dangerous interference with the climate system.

The dimension or complexity of the issue will increase when we attempt to include the biophysical and social-economic impact components in the process of defining what constitute dangerous interference. The question of equity, uncertainty, inter-linkages, regional and national interests, development and sustainability will all need to be

considered. It is very difficult to see how the international scientific community within IPCC can rapidly arrive at an acceptable answer to the problem.

Malaysia agrees with the revision to the title of the paper from “Levels of GHGs in the Atmosphere Preventing Dangerous Anthropogenic Interference with Climate System” to “Levels of GHGs in the Atmosphere and Dangerous Anthropogenic Interference with Climate System”. This new title allow the authors to firstly develop the subject matter from what is scientifically known on it before embarking on difficult task of discussing what constitute dangerous interference with climate system. The scientific facts in the first part can then form the basis and set the boundary for the discussion in the second part. The change of the title is therefore a good move.

(Malaysia)

Prof. Yuri Israel and his team has all the support to go ahead with the task.

(S. N. Sok Appadu – Mauritius)

Having studied your proposals to draw up the Technical Paper we think that preparation of the given Paper is rather important and actual. We have no of principle remarks and concerning it. We would like only that the significant place in the Paper was occupied by regional aspects, in particular by problems of developing countries. Our experts would be pleased to participate in preparation of this Technical Paper.

(Valeriu Cazac – Moldova)

In respons to the request by Dr. N. Sundararaman, Secretary of the IPCC, I hereby inform you that the government of the Netherlands has no comments concerning the content of the Scoping Paper for the Technical Paper Levels of Greenhouse Gases in the Atmosphere and Dangerous Antropogenic Interference with Climate System.

(J. Verbeek – Netherlands)

1. A decision of the IPCC XVIII Session (Wembley, UK, 24-29 September, 2001) on preparation of Scoping paper for the IPCC Technical Paper

LEVELS OF GREENHOUSE GASES IN THE ATMOSPHERE AND DANGEROUS ANTHROPOGENIC INTERFERENCE WITH CLIMATE SYSTEM

is an important practical step towards creating the scientific grounds of UN FCCC, especially its clause 2. This step have been expecting for a long time. This year is very appropriate time for this activity in view of approaching summit in Johannesburg.

2. An idea to develop the Technical paper proposed by Professor Yuri Izrael has already got largely supportive reaction of the world scientific community. In particular, the experts from Australia, Canada, Finland, Germany, Kenya, Russia, Sri Lanka, Sweden and USA have contributed to the Scoping paper.

3. An idea to consider the concept of non-hazardous levels of content of greenhouse gases (GHGs) in the atmosphere and dangerous interference with the climate system mostly from the scientific perspective appears positive. Upon developing and establishing the critical

GHGs level from the perspective of climate-forming, biospheric and socio-economic function of the climate system, the limits further could be clarified through political procedures using socio-economic criteria.

4. A language of the Scoping paper is heavily overloaded by scientific terminology. It is expedient to make the language more common that gives an opportunity for policy-makers to feel themselves more comfortable with the text.

5. More experts from developing countries, especially from the islands states, should be involved into the author team. Their experience and specific point of view on the subject might be very useful in bridging scientific and socio-economic aspects of the issue.

(Alexander I. Bedritsky – Russia)

I am happy that the decision to prepare this TP has been adopted. This is a very important issue and I believe its influence in the future will be significant. I agree that an ultimate decision on selection of major targets and thresholds of tolerable risk etc. is to be taken by the policymakers (page 4, lines 25-29), however, I appeal to the authors of this paper to be clear and straight to the extent possible and thus give policymakers good basis for their decisions.

(Andrej Kranjc - Slovenia)

1) The issue of variability in response (i.e. actual differences in response among different targets, which differences cannot be reduced through further analysis and data) could be highlighted in the text, and separated from uncertainty (i.e. lack of knowledge about the response of the targets, which can be reduced through further analysis and data). Uncertainty will be reduced in the future, variability in response will not.

2) Definition of a "threshold of tolerable risk": both variability in response and uncertainty have to be included in the definition of this threshold of tolerable risk. Variability in response is already taken into account in the text through the concept of "most vulnerable targets". But these targets are selected among LARGE-SCALE targets, and this scale selection can remove important aspects of variability at a smaller (e.g regional) scale. This issue can be expressed too through the importance of the (geographical) distribution of impacts versus the aggregate (large scale) impacts. Regional-scale variability may be essential for defining an adequate "threshold of tolerable risk".

(Miguel Ángel Gaertner – Spain)

Sweden responded to Dr. Izrael as follows: "Dr. Sven Brakenhielm has earlier given some input to your draft. The Swedish Government has no further comments, but we would like to stress the importance of this document".

(Marianne Lillieskold – Sweden)

<Comments by Tchad have been submitted in French. High quality of SP was commended, no specific suggestions were proposed. The Tchad comments can be received from us upon request by fax. - Yuri Izrael >

(Moussa Tchitchaou, - Tchad)

The outcomes of this paper would have two major impacts:

1. Excuse for delay, postpone or cancel reducing emissions if the study find that concentration of GHGs and the rate of changes of GHGs is under critical levels.
2. Stimulate activities that enhance emission reduction if the study find that concentration and rate of change of GHGs is over critical levels.

What ever the results of this study would be, reducing GHG emissions should not be delayed, because uncertainty of changes climate and its impacts are not elucidated. This study will, again, used present information and arbitrary judgement.

Issue to be added:

Are there any evidences in the past, from geological record, ice core or etc, that could tell us about carbon dioxide in the atmosphere, which were in similar concentrations to present level (350 ppm). What the climate and the ecosystems were like. These evidences, if exist, would help to understand changes and impacts that might occur. It may also assist in construction of critical level of GHGs.

(Kansri Boonpragob – Thailand)

We feel that the change of title is not an editorial one (page1,line 40). Changing “preventing” to “and” divert the meaning from a specific focus to a very general issue. We think that the original title better reflect the original purposes of the technical paper (page 1, line 5 to 20).

“Dangerous anthropogenic interference with climate system” is the main topic of the technical paper. The scoping paper does not provide a concrete idea “how to define the “dangerous anthropogenic interference”. What criteria could be used to identify such dangerous GHG levels. This should be clearly defined and discussed in the technical paper.

Several terms are used frequently, but from the discussion, it is either not clearly defined or not specified how to approach in defining the specific terms. Among them are “critical level (page3, line 17, line 43)”, “sub-critical zone (page 4 line 20)”, “critical limits (page 4, line 11), “threshold of tolerable risk (page 4, line 23)

Issues related to the terms above are very important for analysis and its implication. Hence, they need to be carefully, objectively and clearly defined. We believe that most of these terms are critically related to socio-economic functions (particularly risk issues) and hence social norm or socio-economic judgement on risk issues should be carefully considered.)”. We also believe that these terms strongly relate to “dangerous anthropogenic interference” and discussion to link between these two areas should be provided.

Section 4, 5 and 6 containing main substances of the technical paper and the headings of the subsection directly respond to the topic i.e. “Effects of an anthropogenic increase in GHG content...”, the brief notes under them refer to “... an increase in GHGs content..”. To avoid ambiguity and confusion, we *strongly suggest to add the word “anthropogenic” in front of the word “increase” in all the brief explanation under the three headings.*

We understand from the heading of section 4, 5 and 6 that “.. associated change in global climate on...” is change due to an anthropogenic increase in GHG content. It is important to clearly distinguish this from climate change due to an increase in GHG content as defined in the TAR (footnote 1 of technical summary of WGII). *We suggest to provide a footnote defining this (as oppose to the definition in TAR).*

(Thailand)

This is an important subject area, and one in which we need to develop our understanding. However, the proposed Technical Paper, by definition, would only draw on previously published IPCC work. It is hard to see that much more can be done at this stage compared to Question 6 of the TAR Synthesis Report. Perhaps a better approach would be to hold a workshop during the next year or so, and use the topics outlined in the scoping paper as the basis for the workshop agenda. Consideration could then be given to preparing a Special Report if the outcome of the workshop shows sufficient new material ahead of the FAR.

1. There has been no consideration of the costs of stabilisation in the scoping paper. Associated costs will be a matter of fundamental importance when addressing the issue of how to stabilise, and a section on the technological options and costs that could deliver different stabilisation levels would need to be included in any report
2. Stabilisation can be defined in terms of greenhouse gases, radiative forcing, climate response and impacts. These different approaches need to be discussed prior to reaching an agreement on a definition of stabilisation.

3. Consideration should be given to addressing the stabilisation of different gases separately, as well as to the stabilisation of overall greenhouse gas levels. Several of the comments above add weight to our initial suggestion that a workshop would be the best way to address this issue. The following gives an outline of the topics that could be covered by a workshop:

1. Stabilisation definitions and parameters
2. The relationship between critical levels and the rate of change encountered in reaching those levels
3. Methodologies – including a discussion of how best to identify the critical levels for specific targets.
4. The best way to incorporate a policy input
5. Costs of impacts, adaptation and mitigation.
6. Uncertainties
7. Consideration of whether to address greenhouse gases separately, as well as together
8. Modelling/data/presentational requirements
9. Timescales
10. Further work

(UK)

The Technical paper of IPCC " LEVELS OF THE GREENHOUSE GASES IN THE ATMOSPHERE AND DANGEROUS ANTROPOGENIC INTERFERENCE WITH CLIMATE SYSTEM " represents the large interest for Uzbekistan. We believe, that Technical Paper will have exclusive meaning for implementation of regional researches on

climate change problems. It is important, that the Paper contains the necessary formalized definitions, terms of methodological rules, which are necessary for using at realization of climate change influences estimation and development methodologies for quantifying a critical GHGs level and of adaptation measures, as in regional, and on a global scale. The above mentioned Paper will promote the of exceptional significance for understanding of many practical aspects of UNFCCC, especially, in definition of critical levels of GHGs in an atmosphere and their influence on climate system. The problems of dangerous changes in climate system, which are considered in the Technical Paper, in Uzbekistan closely adjoin to problems of biodiversity and combat to desertification.

We think that very important is an attraction to the analysis of later publications. Already in present in region of the Aral Sea Basin the dangerous changes in climate system are observed. In the First National Communication on Climate Change of the Republic of Uzbekistan(1999) is marked:

strong reduction of water resources of Pamir-Alay area is observed presently;
large glaciers in this region are rather vulnerable to climate change;
the reduction of glaciers in the foreseeable future will entail the
negative consequences for volume and mode of a runoff, and also for quality of fresh waters.

The spent assessments had shown, that for 1957-1980 the glaciers of this region had lost 19% of ice stocks, by 2000 the losses had made 14 %, that is a consequence of increasing of air temperature.

On a background of rigid deficiency of water resources in the Aral Sea Basin, it is possible, that already modern level of GHGs concentrations in an atmosphere is close to " maximum permissible " for examined region.

We would like to express gratitude to the authors of the Technical Paper for attraction of general attention to such difficult and necessary problem.

(Tatyana Ososkova – Uzbekistan)

We commend the authors for the development of this paper. We recognize that proposed structure of the above paper and its contents are useful for both policy makers and researchers to anticipate harmful effects of an anthropogenic increase in GHG in the atmosphere as well as dangerous interference with the climate system.

(Dao Duc Tuan, Nguyen Khac Hieua and Nguyen Tien Nguyen – Vietnam)

1. It is commendable for IPCC to develop standards for the critical levels of GHGs in the atmosphere as these will serve as beacons for human activities and hopefully bring about positive change in global economics versus the environment.
2. It is essential that the paper establishes direct links (cause-effect) of GHGs with impacts here on earth. At the moment, it appears that there is a wide gap in knowledge between the science of GHGs and that of actual climatic events on earth hence the controversial positions of various governments on climate change issues.

3. The paper is expected to establish transient critical levels of GHG content in the atmosphere. The need for this is understandable. However, the uncertainty factor in our current data and knowledge still looms large. It is thus vital that the paper strives to attain an acceptable level of scientific objectivity and rationality. This is necessary to avoid any future politicization of the standards to be developed.

(George B. Kasali, Julius P. Daka -Zambia)

SPECIFIC COMMENTS

Page 1, line 23

Put the word: “THEIR” between the words : “AND” and “DANGEROUS”/
(Kenya)

Page 1, title of the Paper, line 24

Could you please insert ‘THE’ between the words of ‘WITH’ and ‘CLIMATE SYSTEM.’
(Andrej Kranjc - Slovenia)

Page 2, line 11

What is “the problem” referred to – is it the issue of attaining stabilisation of greenhouse gases OR the issue of defining the appropriate level? This needs to be clarified.
(Australia)

Page 2, line 24

Put the word: “THEIR” between the words : “PREVENTING” and “DANGEROUS”.
(J. G. Wairoto - Kenya)

Page 2, line 38

Insert CONCENTRATIONS so that it will read LEVELS OF GREENHOUSE GAS CONCENTRATIONS IN THE ATMOSPHERE ... and then use »GHG concentrations« throughout the text. Another option is LEVELS OF GREENHOUSE GASES CONTENT IN THE ATMOSPHERE ... as is being used in the following chapters. I recommend the first option.

Page 2, line 38

Put the word: “THEIR” between the words : “AND” and “DANGEROUS”.
(J. G. Wairoto - Kenya)

Page 2, line 39

Could you please insert ‘THE’ between the words of ‘WITH’ and ‘CLIMATE SYSTEM.’
(Murat Turkes – Turkey)

Page 2, lines 43 to 48,

There is a quotation of the information included in Q.1, of the TAR Synthesis Report. It rightly transcribes that what constitutes “ *dangerous anthropogenic interference with the climate system are value judgements to be determined through social – political processes, taking into account considerations such as development, equity and sustainability as well as uncertainty and risks*”.

(O. Canziani – Argentina)

Page 2 In line 50, on, to line 4, on page 3

it is said that the contents of the proposed Technical Paper will consider long-term levels of greenhouse gases in the atmosphere which may be hazardous (synonym of dangerous – Webster Third New International Dictionary) for the climate system from the perspective of

its climate forming, biosphere and socio-economic function. Therefore, since the hazardous / dangerous condition cannot and shall not be defined from the scientific side, this paragraph is not acceptable.

(O. Canziani – Argentina)

Page 2. Line 50

The SP limits its object to only long-term levels of the GHGs in the atmosphere, however, a rate of changes of GHGs content in the atmosphere is often more critical and relevant to the risks and dangers to human and ecosystems. Therefore, consideration of the both concepts is recommendable.

(S. Nagata – Japan)

Page 3, line 1

At this sentence, names of major GHGs influenced by the human activities, including carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), ozone (O₃) etc., or, at least, a list of the gases included in the ANNEX A of the United Nations Framework Convention on Climate Change's (UNFCCC) Kyoto Protocol (i.e., CO₂, CH₄, N₂O, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF₆)) should be given.

(Murat Turkes – Turkey)

Page 3, line 1

Could you please amend the line 1, as “greenhouse gases (GHGs) in the atmosphere, **which are (very likely) dangerous for the climate system**”

(Murat Turkes – Turkey)

Page 3, Paragraph 1, line 2:

Direct effects on social or economic systems will not be analysed in the TP...

We find very important the analysis of the effects on social or economic systems at this TP, not to leave it for future IPCC assessments.

(Tatjana HEMA, Ermira FIDA and Mirela KAMBERI – Albania)

Page 3, line 3

The scoping paper notes that criteria for assessing direct effects on social or economic systems might be very efficient (should that be ‘effective’) in future IPCC assessments but it is not clear whether the development of the “criteria” will be addressed in the paper.

(Australia)

Page 3, line 4

Delete the word “also”.

(J. G. Wairoto - Kenya)

Page 3 Line 2-4

The whole sentence led by “Direct effects on” should be deleted because such work is essential to identify the critical level as mentioned in the general comments.

(S. Nagata – Japan)

Page 3, lines 2-3

“Direct effects on social or economic systems will not be analysed....” Surely this is exactly what policymakers need, and is essential in deciding what is “dangerous”. This is a further indication that a Technical Paper is premature, due to a lack of the right material.
(UK)

Page 3, line 6-7

Rephrase the last part of the sentence: “An important....” to read: “.....atmosphere will also be considered.”

(J. G. Wairoto - Kenya)

Page 3, Line 8

In the sentence beginning in that line, reference is made to “*complementary concepts*”. It is clear that “rates of change” of GHGs is one of those concepts, but it is not clear which is the other one. A second reading of lines 51 (Page 2) to 10 (Page 3) suggests that “long-term levels” of GHGs is the other concept, albeit it is not introduced as such. Its mention is relatively far away from its implicit reference as a “complementary concept”, so much so that the reader may get lost in the way between those references. I suggest a minor amendment (in boldface) to the sentence for the sake of clarity: namely: “Genre” of TP, in particular, page limitations do not allow us to consider both principal complementary concepts—i.e., long-term levels and rates of change of GHGs— together.”

(Héctor D. Ginzo – Argentina)

Page 3, line 9

Insert the word “and” between the words “principal” and “complementary”.

(J. G. Wairoto - Kenya)

Page 3, lines 9/10, lines 43/44

It is difficult to define a critical level concept without considering the rate of change encountered in reaching that level. Although page limitations necessitate separate consideration of these two concepts, the links between them need to be expanded upon.

(UK)

Page 3, line 12

Rephrase the item to read: “**The Technical Paper aims at the following**”.

(J. G. Wairoto - Kenya)

Page 3 Line 13-20

These aims should be modified as follows based on the general comments.

- ~~analysis~~ consolidation of information on such hazardous (dangerous) levels and/or approaches to quantifying them already presented in reports and other documents of the IPCC;
- ~~overview of the scientific literature on the subject published after 1999 and, therefore, not considered in the IPCC Third Assessment Report (TAR);~~
- attempt to elaborate basic approaches required to quantify ~~construct~~ critical levels of GHGs content in the atmosphere ~~using the IPCC concepts and approaches;~~

- identification of deficiencies of information on the subject including a lack of basic knowledge, monitoring data, and model means, and of a range of priority tasks for the eventual quantification of “a level that would prevent dangerous anthropogenic interference with the climate system.”

(S. Nagata – Japan)

Page 3, line 13

Only the term of ‘**dangerous**’ rather than the phrase of ‘hazardous (dangerous)’ should be used here as in the original usage of it in the Article 2 of the UNFCCC in order to prevent a different interpretation or understanding of this important and complex issue.

(Murat Turkes – Turkey)

Page 3, line 13-14

Rephrase the sentence to read “**analysis of information on such hazardous (dangerous) levels and/or approaches to quantify them in already presented reports and other documents of the IPCC.**”

(Kenya)

Page 3, line 15

This line mentions an “**overview**” of the scientific literature on the subject published after 1999, and, therefore, not covered by the IPCC TAR”

Since overview means “**survey**” “**inspect**”, it shall be replaced by reference, so to read:

- reference on the scientific literature on the subject published after 1999, and, therefore, not assessed in TAR, shall be provided.

(O. Canziani – Argentina)

Page 3, line 15

Add the words: “giving an”: at the beginning of the sentence; and replace the word “therefore”, later in the sentence, with the word: “yet”.

(J. G. Wairoto - Kenya)

Page 3, line 15-16 and line 22

The IPCC Procedures (section 5) specify that Technical Papers are to be based solely on material already in existing IPCC reports and modelling studies that were carried out explicitly as part of existing reports. The reference to literature ‘not considered in the TAR’ suggests that the TP might go beyond published IPCC reports. This should be clarified.

(Australia)

On page 3, line 17.

It is not clear what “**critical levels**” means.

(O. Canziani – Argentina)

Page 3, line 17

Replace the word: “attempt” with “attempting”.

(J. G. Wairoto - Kenya)

Page 3, line 17:

I suggest the inclusion of maximum permissible levels in this point, e.g. "attempt to construct critical levels and maximum permissible levels", due to the importance of this concept.

(Miguel Ángel Gaertner – Spain)

Page 3, line 19

Replace the word: “identification” with “identifying”.

(J. G. Wairoto - Kenya)

Page 3, lines 17 –18 and 19 - 20

Under present situation, it may not reliable to construct critical levels of GHGs content in the atmosphere using IPCC concept and approach, especially the following bullet mention deficiencies of information, lack of basic knowledge etc. How much can we believe or relay on these critical levels.

(Kansri Boonpragob – Thailand)

On page 3, line 22,

It is mentioned that the proposed Technical Paper will be “ *mainly* “ based, etc. Since it shall be based only on the information included in previous IPCC reports, the word mainly is not necessary.

(O. Canziani – Argentina)

Page 3, line 22

Shift the word “mainly” to come between the words: “will” and “be” so that the sentence reads; “.....will mainly be based...”.

(J. G. Wairoto - Kenya)

Page 3, lines 32 to 35

Since this Technical Paper aims to analyze an issue of remarkable importance for the UNFCCC, it is necessary to show the differences between the Convention and the IPCC definitions of Climate Change. Further, since climate change also depends on the anthropogenic aerosol concentrations, reference to these is required. These concepts may be a type of introduction to the three paragraphs suggested.

(O. Canziani – Argentina)

Page 3, lines 37 and 38.

Sub-paragraph 2.1.

In line with the above mentioned, this sub-paragraph should read as follows :

2.1 Anthropogenic Changes in Greenhouse Gas and Aerosols Concentrations in the Atmosphere and the Global Climate Change.

Page 3, lines 40 and 41, it is suggested that this sub-paragraph reads as follows

2.2.- The role of IPCC assessed information on Climate Change in the prevention of dangerous anthropogenic interference with the Climate System.

(O. Canziani – Argentina)

Page 3, sub-title 2.1, lines 37 and 38

Could you please amend the sub-title 2.1 in the lines 37 and 38 to read: “2.1 Greenhouse gases in the atmosphere, anthropogenic **increase of their atmospheric concentrations**, and global climate change”

(Murat Turkes – Turkey)

Page 3, line 40

Delete »support of« so that it will read »... the role(s) of science in defining ...«.

(Andrej Kranjc - Slovenia)

Page 3, line 40

... of science..., *suggestion – add “and social science”* to reflect statement on line 43-48 of page 2

(Thailand)

Page 3, lines 43 and 44,

following the same reasons than above and to be consistent with the intention to define dangerous levels , the sub-paragraph should read:

2.3.- Reference scientific, social and economic information on which decision makers would found an integrated concept of what would be potential range dangerous levels of Greenhouse Gas Concentrations.

(O. Canziani – Argentina)

Page 3 Line 43 – Page 5, Line 3

A new section should be given for the elaboration of a critical level concept both in terms of absolute level and rate of change because this concept has not been well established in terms of climate change. In this section, a range of useful terms and concepts would be proposed to interpret “a level that would prevent dangerous anthropogenic interference with the climate systems.”

(S Nagata – Japan)

Page 3, line 43

Insert »concentrations« between »GHG« and »:« so that it will read »... level of GHG concentrations: a critical ...«.

(Andrej Kranjc - Slovenia)

Page 3, line 43

The term of ‘**non-dangerous**’ should be used here instead of the term ‘non-hazardous.’

(Murat Turkes – Turkey)

Page 3, lines 46 to 48.

This bullet makes evident the above mentioned requirement of showing the differences in the definitions of climate change..

(O. Canziani – Argentina)

Page 3, lines 46, 47 and 48

For this paragraph covers the lines 46, 47 and 48, the vital term of ‘**climate system**’ for this Report should be defined here, or in the footnote, as defined in the IPCC Third Assessment Report. In the IPCC Third Assessment Report (TAR), Climate Change 2001, The Scientific Basis (Contribution of Working Group I to the TAR of the IPCC), the climate system was defined as follows:

“The climate system is the highly complex system consisting of five major components: the atmosphere, the hydrosphere, the cryosphere, the land surface and the biosphere, and the interactions between them. The climate system evolves in time under the influence of its own internal dynamics and because of external forcings such as volcanic eruptions, solar variations and human-induced forcings such as the changing composition of the atmosphere and land-use change.”

(Murat Turkes – Turkey)

Page 3, line 46

Could you please insert the term ‘**cryosphere**’ between the terms of ‘lithosphere’ and ‘hydrosphere.’

(Murat Turkes – Turkey)

Page 3, line 46

Climate forming elements of the geosphere should include also cryoshhere.

(Kansri Boonpragob – Thailand)

Page 4, lines 2 to 6.

It is considered that the word “**target**” should be replaced. The reason is that it may bring confusion regarding its use in connection with the UNFCCC and the Kyoto Protocol. Further, the concept used should expressively emphasize its climate connection. Therefore the concept “climate / environmental objective” might be adopted. In consequence, the bullet should read:

- “Climate / Environmental Objective” is the selected value, rate or rank that may be arrived at in respect of any component or association of components and / or internal processes of the climate system, under the variations of the greenhouse gas concentrations in the atmosphere. Taking into account the interlinkages between climate and other environmental issues and with other elements (i.e. the population growth), different “climate /environmental objectives” may be defined for global, regional and local scales.

(O. Canziani – Argentina)

Page 4 Line 2

A term “target” is used as a recipient of impact, but this term is very ambiguous from a viewpoint of impacts study. In the IPCC Technical Guidelines a recipient of impacts is defined as the “exposure unit”. The IPCC TP should consider using such existing IPCC definitions for avoiding unnecessary debate.

(S. Nagata – Japan)

Page 4, lines 2 and 3:

Part of the sentence seems not clear to me, particularly "elements of the climate system, their interactions, BIOSPHERE OR A COMPONENT OF THE GEOSPHERE" (also at page 5, lines 11 and 12). Does it mean elements of the biosphere or the biosphere as a whole?.

(Miguel Ángel Gaertner – Spain)

Page 4, line 8

Replace the word: “complement” with” the word: “perform”.

(J. G. Wairoto - Kenya)

Page 4, lines 8-12

It is understood that the definitions will be refined and expanded for the actual TP, but as briefly described in the dot point, the concepts of “critical limits” and “sub-critical zone” are very unclear. Does “sub-critical zone” mean any value below critical or just a small zone in the immediate vicinity of critical. If it is the former, then the dot point does not make sense. Also, in line 10, does it necessarily become “impossible” for the climate system to function once it reaches the critical level – could it just become unstable or compromised, or is that a fundamental part of the definition of critical?

(Australia)

Page 4, lines 8 to 12

It is suggested to cancel the concept “*implementing within the climate system* “; consequently, the following text is proposed:

To satisfy the ultimate objective of the UNFCCC, the Climate System should have its internal processes functioning within ranges resulting in climate variables which impacts on the socio-economic structures, as well as their implications on other environmental issues, do not prevent the selection of sustainable development pathways. Such smooth running would continue until a range of Greenhouse Gas Concentrations is reached and the best possible integration of environmental and adaptive actions cannot enable any further sustainable development. Such a range of Greenhouse Gas Concentration levels could be defined as “ Critical Greenhouse Gas Concentration Levels.

(O. Canziani – Argentina)

Page 4, lines 8 – 12

The whole bullet is difficult to understand, especially the first phrase “ The climate system is able to implement its climate-forming

(Kansri Boonpragob – Thailand)

Page 4, lines 9 and 10:

The sentence part "unless and until a state of any target is within a subcritical zone" seems inconsistent with the use of "to ensure that a state of any target is within its subcritical zone"

(Miguel Ángel Gaertner – Spain)

Page 4, line 12

Could you please add the phrase **‘in the atmosphere’** to the end of the line 12 (i.e.,
(Murat Turkes – Turkey)

Page 4, lines 14 to 16

It is suggested that this bullet is cancelled out.

(O. Canziani – Argentina)

Page 4, lines 18 to 21

It seems opportune to mention that the information available in existing IPCC publications would not enable any rational decision. Therefore, a new drafting is required.

(O. Canziani – Argentina)

Page 4, line 28

Delete the words: “equity and”. Also delete the letter “s” from the word: “matters” so as to make the word singular and read: “matter”.

(J. G. Wairoto - Kenya)

Page 4, lines 18-29

The terms used in this section, such as “sub-critical zones” and “critical limits”, do not appear to have been discussed in the TAR. In this case, there should be an explanation of the methods used to define these terms (and it would not be permissible to use the terms in a Technical Paper if they had not previously appeared in the TAR).

(UK)

Page 4, lines 18-29

There needs to be a clearer explanation of how the “threshold of tolerable risk” will be defined and exactly how policy inputs will impact on the scientific selection of targets and risk thresholds. It might be simplest to calculate the effects due to a range of climate forcing, which will enable policy makers to judge the level at which effects become socially or politically unacceptable. (This is similar to the approach adopted in figure 6.3 in the Synthesis Report.)

(UK)

Page 4, line 20.

The concept of "subcritical zone" and its relationship to "threshold of tolerable risk" should be clarified.

(Miguel Ángel Gaertner – Spain)

Page 4, line 21

Suggest that the term “maximum permissible” is policy prescriptive – see earlier general comment.

(Australia)

Page 4, lines 25 to 29

As stems out from the revised second bullet (page 4, lines 2 to 6), it looks as practically impossible to define, based on the available IPCC information, a “selection criteria” for the “target” and the risk thresholds. Neither would be possible to define **“maximum permissible GHG levels”**. Nevertheless, the Technical Paper might set the basis for future research activities. Its input could serve identify assessment areas for the Fourth Assessment Report or create the opportunity for developing a Special Report.

(O. Canziani – Argentina)

Page 4, line 25 – 29

The bullet start by mentioning that criteria for selection of major targets should be mainly by scientific nature, but the last sentence said that “An ultimate decision on this matter is to be taken by the policy makers”. The last sentence is unreasonable, it should be deleted. The criteria is scientific nature, policy maker should, more or less, listen to science not the other way round.

(Kansri Boonpragob – Thailand)

Page 4, line 25-29

In contrast to the statement, we think that criteria in deciding levels of threshold or tolerable risk or permissible GHGs levels should be based on (originated from) social or economic values (e.g. health effects, level of poverty etc.). Scientific nature can provide circumstances, phenomena, situation etc.

(Thailand)

Page 4, line 28

Modify as follows; ‘equity~~and~~, sustainable development and effectiveness.’ We can develop more effective response to climate change that meets human needs more sustainably (see SYR Question 8). When considering the criteria related to the GHGs levels, effectiveness should be taken into consideration.

(Y. Igarashi – Japan)

Page 4 line 31-35

Policy statement, *suggestion – delete*.

(Thailand)

Page 4, lines 31-35

The style of language used here is rather policy prescriptive and needs revision..

(Australia)

Page 4, line 33

Could you please insert the phrase ‘**and Kyoto Protocol**’ between ‘UNFCCC’ and for’, because the global reduction of the GHGs was undertaken by the UNFCCC’s Kyoto Protocol.

(Murat Turkes – Turkey)

Page 4, line 37

This line should be amended to read: “**Non-dangerous long-term level of the global GHGs:**” in order to be consistent with the term of the UNFCCC and with this Technical

Paper, as it has already been proposed for the previous uses of the main term ‘dangerous’ instead of the term ‘hazardous.’

(Murat Turkes – Turkey)

Page 4, line 41

Put the word: “resilience” before the words: “adaptive capacity”.

(J. G. Wairoto - Kenya)

Page 4, line 45

Remove the article “a” so as read: “along with progress.....”

(Kenya)

Page 4, line 48:

"A concept of critical and maximum permissible levels ARE ..."

should be corrected to "A concept of critical and maximum permissible levels IS ..."

(Miguel Ángel Gaertner – Spain)

Page 5 Line 7

A new major issue to be considered should be added in accordance with the above general comments. It reads “What may constitute a level that would prevent dangerous anthropogenic interference with the climate systems?”. Conversely, line 22-27 and line 35-36 should be deleted because these issues are too ambitious to be answered in the TP.

(S. Nagata – Japan)

Page 5, line 8 (and elsewhere the term appears)

The meaning of this question is unclear. By “GHG content”, do you mean atmospheric concentration? The latter term is more meaningful and is preferred.

(Australia)

Page5, lines 8 to 36.

Since the proposed publication would be an IPCC Technical Paper, it is felt that this section needs to be re-written . The new version would permit that the points become aligned with the information available in the IPCC publications. Example of the need to revise the proposed text could be:

- (i) there is not a definition of “ threshold of tolerable risk”
- (ii) no reference is made on critical and maximum permissible GHGs levels in the atmosphere.

2.5.- The extent to which existing IPCC reports and other documents elucidate these issues.

This point needs clarification. Otherwise, may need another numeral and be linked with those below.

3.- Earth’s climate associated with a given long-term level of greenhouse gases content in the atmosphere.

First of all, it is suggested to modify this heading so to read :

3.- The Earth ´s Climate under different GHG concentration levels

(O. Canziani – Argentina)

Page 5, line 8-9

This should not be issue to address here. Heading 3 states that it is merely a summary of major findings of WG1

(Thailand)

Page 5, lines 11, 12, 13 and 14

This paragraph consisting of the lines 11, 12, 13 and 14 should be amended to read as follows:

“Which large-scale targets (the major components of the Earth’s climate system including the biosphere, the interaction between them, and the processes within them) are predominantly affected by a human-induced increase in the atmospheric concentrations of the GHGs and associated global climate change with respect to their climate-forcing (or, radiative forcing), biospheric and/or socio-economic functions?”

In this proposed paragraph, the term of ‘**climate-forcing**’ has been used instead of the term of ‘climate-forming’, considering the IPCC’s definition for the term of ‘radiative forcing.’ In the IPCC Third Assessment Report (TAR), Climate Change 2001, The Scientific Basis (Contribution of Working Group I to the TAR of the IPCC), the term of ‘radiative forcing’ was defined as follows:

“Radiative forcing is the change in the net vertical irradiance at the tropopause due to an internal change or a change in the external forcing of the climate system, such as, for example, a change in the concentration of carbon dioxide or the output of the Sun.”

(Murat Turkes – Turkey)

Page 5, line 11-14

The issue here is “which large-scale targets are predominantly affected” , but description under Section 4, 5, and 6 seems to identify the predominant targets already. Are the contents consistent with the issues identified?

(Thailand)

Page 5, line16

Put the word: “resilience” before the words: “adaptive capacity”.

(J. G. Wairoto - Kenya)

Page 5, line 22- 27

These issues are not critically addressed. *Suggestion – add another section to discuss the technical issues of those critical levels, sub-critical zones, hazardous rate of increase, tolerable rate of change, threshold of tolerable risk etc. (this will fit in well between the existing section 6 and 7 and will provide good background for discussion in section 8)*

(Thailand)

Page 5, line 22

The word risk implies that the level of uncertainty is almost zero. Can this be true for climate change issues? The definition must clearly tackle the uncertainty factor.

(George B. Kasali, Julius P. Daka -Zambia)

Page 5, line 24

The term “maximum permissible” is policy prescriptive. – see earlier comments on this.
(Australia)

Page 5, line 24

Add the word subcritical.

(Carlos Mansilla – Guatemala)

Page 5 line 26-27

What is the difference of “concept of hazardous rate of increase of GHG content” and “concept of tolerable rate of change of GHG content” on page3 line 6. Which one the author wants to compare with the concept of “critical level”?

(Thailand)

Page 5 Line 29-33

These two bullets should be rewritten as follows in line with the comments on the aims of the TP.

“What are the priority studies in the spheres of monitoring, scenario analysis and modeling, impact and risk assessment, mitigation and adaptation potentials and policies to quantify a level that would prevent dangerous anthropogenic interference with the climate systems.”

(S. Nagata – Japan)

Page 5 line 32-33

Issues stated have not been addressed. Note that section 8.4 and 8.5 on line 22-24 of page 9 merely discuss the “role” but not address the “need in near future”.

(Thailand)

Page 6, line 9

Paragraph 3.2: *What are the predominant changes in global climate in response to a given change of GHGs content in the atmosphere*

We propose to add the word *Wind* in the list of predominant changes in Global Climate response. We also propose to list it after the word *clouding* (line 9).

(Tatjana HEMA, Ermira FIDA, Mirela KAMBERI-Albania)

Page 6, lines 36-37

It is not clear what is meant by “decision making strategies” in the current context.

(Héctor D. Ginzo – Argentina)

Page 5 line 35-36

Issues stated have not been addressed.

(Thailand)

Page 5, title 3, lines 42 and 43

The title 3 should be amended to read: **‘3 The Earth’s climate associated with a given long-term level of the atmospheric concentrations of the GHGs’.**

(Murat Turkes – Turkey)

On page 5 lines 46 to 49

It is mentioned that points 3.1 to 3.6 would have the main purpose to briefly **summarize** the major findings of WG I of the IPCC and other IPCC reports regarding cause-response relationships “ GHGs content – Climate “(sic) .

Leaving aside the final phrase, it is clear that it is not only summarizing the main findings of WG I that would enable to fill points from 3.1 to 3.6. Also WG II and WG III contributions and the TAR Synthesis Report, particularly Q.4, would provide the substance of this section.

An adjustment in the drafting will contribute to make it more understandable.

Further,, depending on the intention of the authors of the scoping paper, it would be a choice to also integrate Section 4, so to make Sections 3 and 4 only one section that could be labeled:

3.- The Climate System under different GHG Concentrations. Sensitivity of climate/environmental objectives. Uncertainties

This integration is also considered opportune since it will obviate potential duplications and enable the best use of the number of pages allocated.

5.- Effects of an anthropogenic increase in GHG content in the atmosphere and associated change on biospheric function of the climate system.

(O. Canziani – Argentina)

Page 5, lines 47 and 48

Lines 47 and 48 should be amended to read: “ relationships **between levels of the atmospheric concentrations of the GHGs influenced by the human activities and the Earth’s climate system.**”

(Murat Turkes – Turkey)

Page 6, line 2

Could you please replace the term ‘Climate-forming’ with the term ‘**Climate-forcing.**’

(Murat Turkes – Turkey)

Page 6, Paragraph 3.2:

What are the predominant changes in global climate in response to a given change of GHGs content in the atmosphere

We propose to add the word *Wind* in the list of predominant changes in Global Climate response. We also propose to list it after the word *clouding* (line 9).

(Tatjana HEMA, Ermira FIDA and .Mirela KAMBERI – Albania)

Page 6, line 5

Is this to be based on observed and/or projected model studies? There is a lot of information to be summarised in a small space, given the page allocation

(Australia)

Page 6, lines 5-12:

Wind might be included explicitly together with other climate elements.

(Miguel Ángel Gaertner – Spain)

Page 6, line 5

The changes in the indicated variables (temperature, clouding up to climate extremes) while observable within the individual variables, usually it is the combined interaction of the stated variables that has the greatest impact on global climate. The paper must therefore attempt to consider these interactions and their outcomes.

(George B. Kasali, Julius P. Daka -Zambia)

Page 6, line 9

Should be “Cloudiness”.

(Australia)

Page 6, line 9

Could you please replace the term ‘Clouding’ with the term ‘**Cloud cover**’ (or, with ‘**Cloudiness**’).

(Murat Turkes – Turkey)

Page 6, lines 10-12

Insert new point »Atmospheric flux of terrestrial (IR) radiation«.

(Andrej Kranjc - Slovenia)

Page 6, title 3.4, lines 16 and 17

Could you please amend this title to read: “**3.4 Cause-response relationships describing dependence of change in the global climate on a change in the atmospheric concentrations of the GHGs**”.

(Murat Turkes – Turkey)

Page 6, line 14

Regional aspects of what – magnitudes, trends etc of climate change? To what level of detail?

(Australia)

Page 6, Lines 24-26

The existing formulation of this title is too difficult to understand.

My suggestion is to replace "on" in line 25 by "due to" which makes the title more understandable.

(Martiros Tsarukyan – Armenia)

Page 6, line 24

Suggest that the term “anthropogenic” is redundant in this context (which focuses on the *effects* of an increase rather than the *cause*), and risks being viewed as non policy neutral. [Similarly Page 7, line 7, & line 39];

(Australia)

Page 6, title 4, lines 24, 25 and 26

Could you please amend this title to read: “**4 Effects of an anthropogenic increase in the atmospheric concentrations of the GHGs and associated change in the global climate**”

on the climate-forcing function of the increased atmospheric concentrations of the GHGs”.

(Murat Turkes – Turkey)

Page 6, lines 29, 30 and 31

Could you please amend the first sentence in the lines 29, 30 and 31 to read: **“The large-scale targets predominantly affected by an anthropogenic increase in the atmospheric concentrations of the GHGs and associated change in the global climate will be assessed in this section from the perspective of the climate-forcing function of the increased GHGs concentrations in the atmosphere (or, of the increased greenhouse effect)”.**

(Murat Turkes – Turkey)

Page 6, sub-title 4.1, lines 34 and 35

This sub-title should be amended to read: **“4.1 The large-scale targets predominantly affected by an anthropogenic increase in the atmospheric concentrations of the GHGs and associated change in the global climate”.**

(Murat Turkes – Turkey)

Page 6, line 34

The targets appear to be at a very large and thus coarse scale. It is well known that scale influences both the state and dynamics of any cause-response relationship. People need to identify themselves with the findings of the paper, hence the need to reduce the target scales.

(George B. Kasali, Julius P. Daka -Zambia)

Page 6, line 37

Could you please use the term **‘land surface’** (or, **‘lithosphere’**) instead of the term **‘pedosphere’**, because the **‘land surface’** (or, **‘lithosphere’**) is one of the major components of the Earth’s climate system and includes the pedosphere.

(Murat Turkes – Turkey)

Page 6, line 39

Could you please amend this line to read: **“Interactions between the major components of the climate system and the processes within the climate system”.**

(Murat Turkes – Turkey)

Page 6 Line 49 – Page 7 Line 2, Page 7 Line 32-34, Page 8 Line 16-18

These sub-sections should be replaced with a sub-section entitled **“Approaches to identify the most vulnerable targets and their critical limits”** because the original ones seem too ambitious.

(S. Nagata – Japan)

Page 6 Line 47

The meaning of **“non-climate factors”** should be clarified because this concept is rather unfamiliar in the previous IPCC reports.

(S. Nagata – Japan)

Page 7, section 5

Consideration of the direct effects of increased CO₂ should be included in this section.

(UK)

Page 7, line 7

See comment for Page 6, line 24

(Australia)

Page 7 Line 7 & Page 7 Line 39 (also Page 3 Line 2)

The meanings of “biospheric function” and “socio-economic function” of the climate system should be made clear in the SP.

(S Nagata – Japan)

Page 7, title 5, lines 7 and 8

Could you please amend the title 5 in the lines 7 and 8 to read: “Effects of an anthropogenic increase in **the atmospheric concentrations of the GHGs and associated change on biospheric function of the climate system**”.

(Murat Turkes – Turkey)

Page 7. Line 10

To obtain a greater clarity will be better to substitute the word “leaves” for “exceed” or “surpasses”. Would the word “Leaves” to include a return toward the sub critical zone or inferior to this. I recommend that an english speaker will analyze it.

For any target would be also important to define the inferior limit of the sub critical zone, assuming that the superior limit superior of this is the "critical limit". Equally, perhaps it will be also convenient to define the critical zone (above of the critical limit) and other zone below the inferior limit of the sub critical zone (normal zone?).

(Carlos M. López Cabrera – Cuba)

On page 7, lines 11 to 16.

Assuming, as it should be the case, that previous sections spelt out the different components of the global environment, this section would provide the information on the interlinkages between the climate system and other environmental issues, in particular those related to the inputs of the external source (Sun) and its distribution on the many functions taking place in the biosphere (photosynthesis, evaporation, activation of air and water pollutants, etc.

If so, these lines should be redrafted including the references on the previous IPCC publications to be used (i.e. WG I contribution to TAR, SRES, etc).

In view of the contents of this section and because the standard use of the climate related terminology, it may be opportune to have the title reading as follows:

5.- Effects of anthropogenic increases in the greenhouse gases and aerosol concentrations in the atmosphere. Changes in the biosphere cycles and functions involved in the climate system.

Note : The replacement of “*Target*” by “*Climate / Environmental Objectives*” would permit a better approach to the issues to be dealt with within this section.

**6.- Effects of anthropogenic increase in GHGs content in the atmosphere and associated change on socio-economic function of the climate system
(Argentina)**

On page 7. Line 15

According to the previous suggestion, to substitute the word "leaves" by “exceed” or “surpasses”.

(Carlos M. López Cabrera – Cuba)

On page 7. Line 14

This definition gives the impression of be something confusing by the use of the word “critical” in two occasions. Perhaps it will be better to substitute the one, which appears in the line 16 by other word that expresses the idea with greater clarity.

(Carlos M. López Cabrera – Cuba)

Page 7, line 18-19

Given the ongoing TP on Climate Change and Biodiversity, is there a risk of overlap and duplication?

(Australia)

Page 7, line 18

Replace “soil and marine” with “and aquatic”. **Note:** soil is part of terrestrial ecosystems and Marine is part of aquatic ecosystems.

(Kenya)

On page 7. Line 20

It is suggested to add (or outside) after the word “within”
(... within (or outside) its sub – critical zone”.

(Carlos M. López Cabrera – Cuba)

Page 7, line 39

See comment for Page 6, line 24

(Australia)

Page 7, title 6, lines 39 and 40

Could you please amend the title 6 in the lines 39 and 40 to read: “Effects of an anthropogenic increase in **the atmospheric concentrations of the GHGs** and associated change on socio-economic function of the climate system”.

(Murat Turkes – Turkey)

Page 7, line 40

Replace the words: “Change on ...climate system”: with “Impacts of Climate Change on socio-economic functions”.

(J. G. Wairoto - Kenya)

Page 7, lines 43 to 46.

The text within these lines may deserve a new presentation, with indication of the IPCC information available. In this regard, the following text is suggested.

As shown in the IPCC publications and reports (SAR, TAR, SR, SRES, TP II and III, etc), the changes in the greenhouse gases and aerosol concentrations in the atmosphere, and the resulting changes in the climate system, have originated a host of impacts, either adverse or beneficial, in the natural and human systems and services, and human health, defining the functioning of the social, economic and even cultural components. They also influence the other environmental issues related to climate change. This section will also consider the implications of these large scale effects, their inertia and time scales. Information would be provided on the most vulnerable climate/environmental objective and estimates of projected effects will be also provided.

Regarding the last two sections, the lack of an IPCC “official” definition , suggest no to comment of sections 7 and 8.

(O. Canziani – Argentina)

Page 7, line 43

Could you please replace the phrase of ‘may heavily’ with the phrase of ‘**would considerably**’ (or, ‘**significantly**’).

(Murat Turkes – Turkey)

On page 7. Line 48. Note 3

To attempt to construct the multidimensional version of the concepts for the critical and maximum permissible levels and to facilitate the analysis of combined effects, synergism etc. using the IPCC concepts and approaches would be necessary the use of the GWPs. The GWP values adopted at the Third Session of the UNFCCC, CP are fixed weighting factors. However, that GWP values have significant uncertainties associated with them. An overall assessment of “total equivalent concentrations” should this fact into account. This is one of the topics that require of a greater attention within the IPCC activities.

(Carlos M. López Cabrera – Cuba)

Page 7, line 48 – Page 8, line 10

This section lists some “targets” and then analyzes the vulnerability of them. In the consistency with WG2 SPM of SYR, the subsections 6.1 to 6.6 should be rewritten as follows;

- 6.1 Hydrology and Water Resources
- 6.2 Agriculture and Food Security
- 6.3 Terrestrial and Freshwater Ecosystems
- 6.4 Coastal Zones and Marine Ecosystems
- 6.5 Human Health
- 6.7 Human Settlements, Energy, and Industry
- 6.8 Insurance and Other Financial Services

(Y. Igarashi – Japan)

Page 8, Line 9

Shouldn't it be "cloudiness" or "cloud formation" instead of "clouding" (in the original)? The noun "clouding" has nothing to do with clouds (See the Webster's dictionary)

(Héctor D. Ginzo – Argentina)

Page 8, line 23 on

It is not clear that published IPCC reports provide a sufficient basis for construction of the framework as described, even on an "example" basis. It would be useful to give an idea of which parts of which IPCC reports are likely to yield the raw material for this section.

(Australia)

Page 8 Line 23-49

This section should be devoted to the elaboration of basic approaches to identify a critical GHGs content in the atmosphere, and the titles of the section and sub-sections should be rewritten. "An example construction of critical levels of GHGs content in the atmosphere", as proposed in the original text, is too ambitious and premature. Therefore, the title of this section should be "Approaches to identify hazardous (dangerous) levels of GHGs in the atmosphere", and subsequent sub-sections should be devoted to the discussions on possible steps necessary to reach the overall hazardous levels and approaches possibly taken in each step. The titles of sub-sections may include: identification of major exposure units; hazardous levels and risk thresholds for each exposure unit; other issues to be considered such as mitigation potentials and socioeconomic consideration; overall hazardous levels; and other issues.

(S. Nagata – Japan)

Page 8, title 7, line 23

Could you please amend the title 7 to read: "7 Critical levels of the atmospheric concentrations of the GHGs".

(Murat Turkes – Turkey)

On page 8 Line 29

Since it is a topic that leaves outside the scope of the Technical Paper, would be convenient to implement methods of good practice to quantify uncertainties in practice for the concentrations of each GHG, and the GHGs aggregated concentrations. Here, it can be necessary to develop more the evaluation of uncertainties for GWP values.

(George B. Kasali, Julius P. Daka -Zambia)

Among other of the many fundamental studies that are required by the analysis of this complex problem, is required to improve the knowledge about the atmospheric residence times and the removal mechanisms for some of the GHG of direct effect (especially CH₄ and N₂O). Other important topics as the indirect GHG and the aerosols, apparently are outside the scope of the TP, but they are aspects that should not be ignored specially for the combined analysis of the different elements that can influence on the GHG levels in the atmosphere.

(Carlos M. López Cabrera – Cuba)

On page 8. Line 32

The information from the WMO - Global Atmosphere Watch indicates that the coverage of monitoring stations for the N₂O (and the stations that report data for this gas to the World Date Center for GHG) is small in comparison to the CO₂ and CH₄. Given the importance of the N₂O due to its high GWP value, is required to expand more the current monitoring coverage for this gas. This can contribute to reduce the uncertainties that exist on its current concentration values.

(Carlos M. López Cabrera – Cuba)

Page 8, line 32

In considering the future modification of both the limits and thresholds, the paper must tackle the roles of irreversibility and complexity in climatic processes. Moreover, the tentative nature of these limits makes them very vulnerable to political manipulations.

(George B. Kasali, Julius P. Daka - Zambia)

Page 8 Line 40

Sections 7.3 & 7.5 deal with critical levels and maximum permissible levels for major anthropogenic GHGs (CO₂, NO₂, CH₄, O₃), individually and in combination. It is understood that GHGs formulate greenhouse gas effect in combination, then what is the intention of separating GHGs?

(S. Nagata – Japan)

Page 8, line 40 and 46:

Insert N₂O in the sentence (between brackets). Reason: N₂O with high global warming potential is one of major anthropogenic GHGs. Its concentration in the atmosphere has been fairly increased since pre-industrial era (from 285 to 310 ppbv). Critical level and maximum permissible levels for N₂O need calculating.

(Dao Duc Tuan, Nguyen Khac Hieua and Nguyen Tien Nguyen – Vietnam)

Page 8, line 45

The term ‘non-hazardous’ should be deleted, and the term ‘not dangerous’ should be replaced with the term ‘**non-dangerous**’ within the brackets.

(Murat Turkes – Turkey)

Page 9 Line 3-28

This section should be devoted to the identification of deficiencies of information to eventually quantify “a level that would prevent dangerous anthropogenic interference with the climate system.” In this regard, the titles of the section and sub-sections are proposed to be rewritten as follows.

8 Prospects for the quantification of “a level that would prevent dangerous anthropogenic interference with the climate system”

8.1 (as it stands)

(Original 8.2 should be deleted.)

8.2 Critical gaps in fundamental knowledge and further research needs (original 8.3)

8.3 A role of monitoring and necessity of further progress

8.4 A role of scenario analysis and models and necessity of further progress

8.5 A role of impact and risk assessment and necessity of further progress

8.6 A role of research on mitigation and adaptation potentials and policies and necessity of further progress

8.7 Approaches for comprehensive and integrated investigations

(S. Nagata – Japan)

Page 9, title 8, lines 3 and 4

Could you please amend the title 8 to read: “8 Prospects for estimations of critical **levels of the atmospheric concentrations of the GHGs within the IPCC framework**”.

(Murat Turkes – Turkey)

Page 9, line7

Replace the words: “A degree”, with: “The extent”.

(J. G. Wairoto - Kenya)

Page 9, lines 9-11

The identification of areas for further work would be best addressed at a workshop, where there is a policy input, rather than in a Technical Paper.

(UK)

Page 9, line13

Replace the words: “The degree” with: “The extent”.

(J. G. Wairoto - Kenya)

Page 9, line17-18

Replace the words: “and therefore not” with the words: “which has not been”.

(J. G. Wairoto - Kenya)

Page 9, line 20

Recommendations for further research must stress the necessity for equitable participation in these activities especially for African countries. Until the whole world attains a basic shared understanding of the principles governing global climate, it will be very difficult for mother earth to stabilize greenhouse gas concentrations in the atmosphere.

(George B. Kasali, Julius P. Daka -Zambia)

Page 9, line 22

Replace the article: “A” with the article: “The”.

(Kenya)

Page 9, line 22:

"A role of models ..." may be changed to "The role of models...", for consistency with page 9, line 24 "The role of monitoring ...".

(Miguel Ángel Gaertner – Spain)

Page 9, lines 31 to 36

9.- Summary

As suggested above, references to the TAR Synthesis Report would be included before reaching this section. Therefore, appropriate cross reference is needed.

!0 .- List of publication on the problem published from 1999 to 2002 and not analyzed in the TAR.

This section should follow the one on Bibliography and its heading could be:

Additional publication on related subjects, published from 1999 and 2002, which were not assessed in TAR.

(Argentina)

Page 9, line 31-36

This does not sound like a summary; it seems to overlap somewhat with the scope and intent of the previous section. Could more usefully be a (shorter) real summary of the key findings, conclusions etc of the TP. Not clear what is meant by the “framework of priorities stated by the XVIII Session of the IPCC”.

(Australia)

Page 9, line 39

Is this a valid inclusion in a TP?

(Australia)

Page 10, line 4

Put the word : “THEIR” between the words : “AND” and “DANGEROUS”.

(J. G. Wairoto - Kenya)

Page 10, line 4

Put the word : “THEIR” between the words : “AND” and “DANGEROUS”.

(J. G. Wairoto - Kenya)