

***Report of the Joint IPCC WG II & III Expert meeting on
the integration of Adaptation, Mitigation and Sustainable
Development into the 4th IPCC Assessment Report***

St Denis, Reunion Island, France

February 16 – 18, 2005

Supporting material prepared for consideration by the Intergovernmental Panel on Climate Change. This material has not been subjected to formal IPCC review processes.

This expert meeting was agreed in advance as part of the IPCC work plan, but this does not imply working group or panel endorsement or approval of this report or any recommendations or conclusions contained herein.

Introduction

Mandate

When approving the outlines of the Working Group contributions to the AR4 the IPCC Plenary at its 21st session agreed to put special emphasis on a number of cross-cutting issues to ensure a better and more coherent treatment of these issues across the various Working Group contributions. The interlinkages between Adaptation and Mitigation (AM) and Sustainable Development (SD) are two of those cross-cutting issues. Both are relevant to Working Groups II and III. In order to implement the ambitions regarding these cross-cutting issues the 21st Plenary approved holding this Expert Meeting. Given the busy schedule of author selection and preparing for the first lead author (LA) meetings, it was decided to first have a small planning meeting with key authors of both Working Group II and III, in advance of their first LA meetings. This meeting took place on September 1-2, 2004 in Amsterdam and resulted in a set of agreed principles for elaborating the WG II and III outlines with respect to AM and SD. The meeting also developed a proposal for this Expert Meeting on AM and SD that was held at Reunion Island, France from February 16-18, 2005, kindly hosted by the French government.

Objectives & Deliverables

In Amsterdam, it was decided to have the following objectives for the meeting at Reunion Island:

- To feed new views from outside the climate change literature into the assessment of WG II and WG III concerning the strongly interrelated area of adaptation, mitigation and sustainable development.
- to dove-tail zero-order draft texts of WG II and WG III (by the authors) with a view to ensuring that the treatment of AM – SD issues in both assessments is: “Consistent, Complementary, Concise and Complete” (“4 Cs”).

Furthermore, it was decided that the deliverables should be:

- Recommendations for the writing team of WG II fourth Assessment Report (AR4) for incorporation of AM and SD issues in their First Order Draft (following their 2nd Lead Author meeting in Cairns, 14-17 March 2005)
- Recommendations for the writing team of WG III for incorporation in their Zero-order Draft (ZOD, to be completed 11 March 2005)

Scope of the meeting

The programme of the meeting was developed by the TSUs of WG II and III under the responsibility of the co-chairs of WG II and III. Day 1 the programme was devoted to a series of key note speakers, covering both potential user views as well as relevant new perspectives on the handling of AM and SD issues. These areas have not been fully addressed in the IPCC assessment work to date. The invited experts elaborated on ‘new science areas’ or ‘new literatures’ that inform parts of the AR4. The morning programme of Day 1 also contained an opening session featuring Dr Pachauri, several ministers of Environment of neighbouring Small Island States, a representative of the European Parliament, and government officials from both the French Republic and Reunion Island. Day 2 and 3 were used for working sessions between authors on the integration of adaptation, mitigation and sustainable development into the

contributions of Working Groups II and III of the AR4. The full programme is attached as appendix A.

The meeting brought together more than forty experts, all of whom are WGII or WGIII AR4 authors. In addition there were a number of external experts and speakers from outside the AR4, with expertise relevant to particular aspects of adaptation, mitigation and/or sustainable development. The full participants list is attached as appendix B.

This report reflects the main issues addressed during day 1 of the programme and key recommendations emerging from the work by experts and AR4 authors during day 2 and 3. Full presentations of speakers can be found on the open WG III website of the IPCC:

<http://www.ipcc-wg3.org>

Day 1:

Official opening session

The official opening session was attended by the President of the Regional Council of Reunion Island, Mr. Verges, together with Ministers of the Environment of the Republic of the Comoro Islands and the Republic of Mauritius, representatives of the Ministries of Environment of the Republic of Madagascar and the Republic of the Seychelles, the Prefect of Reunion Island, the President of the General Council of Reunion Island, members of the European Parliament and the Chairman of the IPCC, Dr Pachauri.

Mr Verges welcomed the participants on behalf of the Regional Council and the Government of France. He stressed the fact that the efforts being made today to develop the island might come to nothing as a result of climate change. He said it is urgent to do something now, and take preventive action, since we know what consequences of climate change lie ahead. He considered the topic of the meeting, the relationship between sustainable development and climate change, of utmost importance.

Dr Pachauri highlighted the policy relevance of the Cross Cutting Themes, because there is a great power in aggregation of connected issues and taking an integrated view in the various diverse aspects of climate change. He also highlighted that at this stage it would be useful to identify issues on which detailed literature search would be critical, such as green accounting, assessment of damage functions from climate change and in the context of sustainable development assessing literature that covered regional and cultural aspects as well as the issue of geographical diversity. Finally, he said that we should orient our view of the subject of the workshop within a future perspective and not in a static context based only on today's realities.

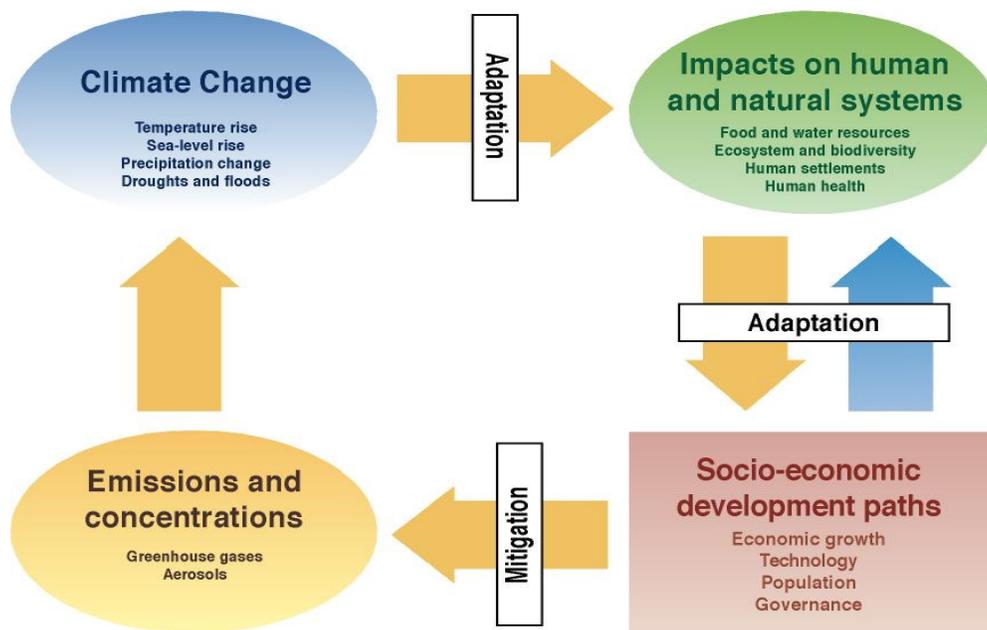
Introduction by Bert Metz (Co-chair WG III)

Bert Metz provided the participants with the background to the meeting explaining the relevance of the cross-cutting themes (CCTs) identified for AR4, the outcome of the AM-SD Planning meeting (September 2004, Amsterdam), the establishment of the Virtual Coordination Group (VCG) that will be given more impetus at this meeting, the progress made at the 1st Lead Author

Meetings (LAMs) of both WG II and III, and the zero order drafts (ZODs) that are currently being elaborated by the WGs.

Why a joint AM-SD meeting? He explained that development is a driver of human-induced climate change (CC) but that climate change also affects development, often in a negative way (see figure 1); that both adaptation (A) and mitigation (M) are strongly connected to development paths, for instance because adaptive and mitigative capacity are strongly linked to development; that the challenge is to make development more sustainable (rather than to speak about a (rather theoretical) sustainable development. Making development more sustainable can be done by integrating CC into development strategies, making development climate friendly (i.e. getting to low GHG emission economies) and climate proof (enhancing resilience against climate variability and climate change), and enhancing adaptive and mitigative capacities.

Figure 1:



Bert Metz reiterated the objectives of the meeting: to incorporate new views and to dove-tail WG II and III ZOD drafts, bearing in mind ‘the 4 Cs’: consistency, complementarity, conciseness and completeness. Meeting deliverables will be used as input for both WGs and to establish practical coordination arrangements for further work through the Virtual Coordination Group (VCG).

Key note speeches

I Janos Pasztor (Head SD Programme UNFCCC Secretariat): Policy needs for assessing the integration of adaptation, mitigation and sustainable development

Janos Pasztor emphasized that A and M contribute towards SD and that SD measures contribute to A and M. He noted that the SD processes that are influencing the UNFCCC are: Agenda 21 (1992), the Millennium Development Goals (2000), and the outcomes of the World Summit on SD (2002). He listed the areas where the UNFCCC and the Kyoto Protocol (KP) are related to AM and SD. For the UNFCCC this is predominantly in articles 2, 3 and 4, and for the KP articles 10 and 12.

He further elaborated the key COP decisions that touch on AM & SD, which are:

- COP 7: the Marrakesh Accords which institutes funding for AM in support of SD (5/CP.7), a framework for the Transfer of Technology, and the operational details for the Kyoto mechanisms;
- COP 8: the Delhi Ministerial Declaration;
- COP 9: scientific, technical and socio-economic aspects of impacts of and vulnerability and adaptation to CC and of mitigation; and,
- COP10: Buenos Aires programme of work on adaptation and response measures.

He stressed that currently the dispersal of funds is inhibited by several obstacles, namely:

- The attribution question: are impacts caused by (existing) climate variability or by climate change? Under the UNFCCC/ KP funding arrangements for adaptation only costs are considered as a result of human induced climate change. Therefore one has to factor out the contribution of human induced climate change which may be difficult or impossible. This provides therefore a key challenge to the AR4.
- GEF Funding paradox: a requirement for GEF funding is to have global environmental benefits, while adaptation is by definition local. This points to a need to come up with alternative funding paradigms for adaptation.

He also touched upon the question to what extent non-climate policy forums (through mainstreaming of CC in their policy area) can influence and complement the UNFCCC process. He continued by stressing that the successful integration of A and M and mainstreaming CC into SD depend on the IPCC to provide clear, policy-relevant information in a number of areas. Where scientific uncertainty and understanding does not allow the provision of such information, instead of providing no information at all, the scientific community should clearly state what is known, and what is not (i.e. the limits of science).

Discussant: Saleem Huq

Saleem Huq stated that although the “real world” may not be aware of CC, they will be or are being confronted with it. The real world is dealing with CC to some extent through risk management on for instance water resource management (taking CC into account in investment planning and prognoses), etc.

He also mentioned that in developing countries the awareness of CC is still relatively low. And even if awareness exists, countries have no resources to deal with CC. In National Adaptation

Programmes of Action (NAPAs) they have to choose of how to adapt in the long term to CC or how to adapt in the short term to climate variability. This distinction is forced upon them by the UNFCCC rules and not always beneficial to the countries' broader development strategies. AR4 should assess the "real world situation" and feed that into the UNFCCC process. This cannot always be based on peer-reviewed literature because not much is available at this point in time.

Discussant: Dilip Ahuja

In the past the approach has been to latch on to the "CC bandwagon", followed by the "SD bandwagon". Now we are back to CC and have gone full circle. All in all the climate community is waking up to the humbling realisation that we can do very little. What is needed most is a consistent message (from science) to the outside world to mobilise funding. As long as the scientific community argues over what is real and what not, politicians will not (financially) support the CC cause. At this moment the message has become too complex, too context-specific, etc.

General discussion:

During the following discussion it was argued that we should not worry about attribution from an adaptation-perspective: variability is a good way to start to think about adaptation to change. , It was also stated that the separation of CC and variability is (too) complex, especially with respect to adaptation. Bert Metz added that the distinction between climate variability and human induced climate change is a policy issues: it doesn't live so much amongst scientists. Nevertheless, if IPCC wants to be policy relevant, the science community has to provide answers/information to the policy community on these issues.

In response to the general discussion Janos Pasztor made a few additional comments:

- Local or regional models and answers are necessary as there is not *one* answer;
- There is a need to separate CC and variability because the UNFCCC process needs it; and,
- The relationship between achieving the Millennium Development Goals (MDGs) and dealing with CC is probably crucial but, not enough quantitative analyses exist about it.

II Michael Glantz (Senior Scientist Environmental and Societal Impacts Group, National Centre for Atmospheric Research, Boulder, Colorado, USA): Why good climates go bad? Creeping environmental change.

Michael Glantz argued that there is no such thing as good or bad climates, but there are tolerable or non-tolerable climates. But who decides what is tolerable? An Eskimo doesn't want to live in the Sahara: what is a harsh climate and to whom? Is it a matter of perception? However, second-order effects on society (i.e. when there are changes in the climate to which a society is adapted) can be large.

He also argued that climate change is typically a creeping environmental change: there is a long term, low grade and cumulative change. These are not easily addressed by governments. This is partly caused by the fact that in general people are looking for dramatic climate events, whilst less dramatic events are happening at this moment. Michael Glantz illustrated this point using the Aral Sea case as an example. This was at some stage the 4th largest inland sea but is now nearly gone due to the subtraction of water for cotton production from the two rivers feeding the Aral Sea. He asked the question: do we care? Fishery ended, toxic dust storms now occur, there has been a 22 meter drop of the water level, and huge unemployment is the result.

Michael Glantz' message was: we cannot wait for the science; it will take too long to reduce all uncertainties and get a complete picture of all the possible impacts of climate change, while the decision making processes are ill-equipped for dealing with creeping changes. Instead, he argued, we need to rely on subjective thresholds; however, subjective thresholds create opposing views. He underscored the need to apply the precautionary principle and the need to use SWOT analyses (strengths, weaknesses, opportunities, threats). As an example of how to tackle this issue, he suggested science would need to start analyse "seasons of storms" as well, arguing that one super storm may not be a real extreme event but that e.g. five 'ordinary' hurricanes or storms hitting one area in a short period of time – each individually not "too bad" – together form a season of storm that may bring the message home about the ongoing changes. He argued we need to stop searching for the "high-impact dread factors." In this context he argued that early warning systems may well be more important than some governments realise. (Scientific) Lessons will be late, but at least we will have early warnings!

He also addressed the importance of choosing our words in communicating about climate change and its impacts and considering the way these words will work in "the real world". For instance he recommended to stop focusing on uncertainties, but focus on certainties. For instance, the climate of the future may already be present today somewhere and that may be a way to communicate the implications of climate change in a much more direct way. Also, "global warming" is, in his opinion, a clearer concept than "climate change".

Discussant: Ferenc Toth

Ferenc Toth argued that searching for the "dread factor" remains important. He also stated that adapting is not easy and cheap and that adaptation can therefore have an important impact on development. He also argued that the scientific community should not down-play the importance of uncertainty because this could be used by the "naysayers" to discredit all statements. Rather, one should try to explain the climate-change-related nuisances we already know might come (e.g., the frequency and severity of extreme events) to get a stronger and more urgent message across to ascertain that the message is being heard and will lead to action.

Discussant: Olga Krankina

Olga Krankina argued that even though changes in mean temperature and atmospheric CO₂ concentrations are creeping, they often express themselves as extreme events and abrupt changes once certain thresholds are exceeded (e.g. Gulf Stream shutting off). She suggested that in responding to questions about attribution of observed extreme events to CC we point out that we are certain that as the climate changes, we will see more of these events (even though we are not certain that CC caused any particular extreme event). While politicians respond mostly to immediate threats, they also take action to address "creeping changes".

She also pointed out that human adaptability is much greater than adaptability of many other species and ecosystems and that therefore vulnerabilities may have to be analysed in terms of indirect effects of changing human habitat, rather than in terms of direct impacts of changing climate on humans.

General discussion:

One participant disagreed with Glantz on the use of the term "global warming", because this is easily associated with a pleasant gradual improvement of the weather, while climate change (and particularly extremes) is more easily recognised as potentially unpleasant.

**III Kirit Parikh (Integrated Research and Action for Development (IRADE), and member of the Government of India's Planning Commission):
Development from a southern perspective**

Kirit Parikh started by saying that any government has as prime objective to raise the social well-being of its people and to eradicate poverty. He continued with an elaboration of the dimensions of poverty, deprivation and exclusion, illustrating his point with a quote from Gandhi saying that “even God does not dare to appear in front of the hungry person in any form other than food”.

Kirit Parikh outlined an approach how to make local people 'agents' for SD, elaborating policies, actions for SD, and mentioning economic instruments. In this context he stressed that consumption patterns are the driving force for CC and that this implies that per capita emissions are the most equitable way to determine how nations should contribute to the global efforts on mitigating climate change. He further argued that even with adaptation, impacts may remain intolerable. Furthermore, he said that the fragmentation of available funds is an obstacle to dealing effectively and rationally with climate change in the context of sustainable development.

He concluded his presentation with a study on agriculture in India. The main message was that if Indian farmers would adapt as Americans can, the loss of agriculture GDP would be 5% and not 25%. The main difference is that American farmers can adapt better than Indian farmers because of the public investments in irrigation, research and education.

IV Mohan Munasinghe (Munasinghe Institute for Development (MIND)): Using the Action Impact Matrix (AIM)

Mohan Munasinghe stated that there are methods available to evaluate the impact of development options on sustainability, including climate aspects such as emission levels and vulnerability. He presented an Action Impact assessment Matrix (called AIM) to link a CC response to national development strategies. With this methodology it is possible to understand better the interactions among three key elements, at a country-specific level:

- national development policies and goals;
- key SD issues and indicators; and,
- CC adaptation and mitigation.

According to Mohan Munasinghe, AIM helps to integrate CC within SD. AIM has been used since the early 1990s to link macroeconomic policies and environment. The four 'AIMs' that are used in AM-SD analyses are: Adaptation Effects on Development; Development Effects on Adaptation; Mitigation Effects on Development; and Development Effects on Mitigation. He explained the AIM methodology using a case study from Sri Lanka.

Discussant: Atiq Rahman

Atiq Rahman had two main messages in his response to the two presentations of Parikh and Munasinghe:

- 1 In the past it used to be 'science → policy', but now it is 'science → policy → people'; and,
- 2 The AIM methodology looks good but it has to be understood how it is applied locally.

Discussant: Njeri Wamukonya

The concept sustainable development is still not well understood by experts, let alone practitioners. It is not uncommon for a policy maker to request an expert to prepare a 'sustainable development' project. However IPCC should not be bogged down with defining SD but rather focus on promoting avoidance of unsustainable practices and policies.

Equity issues are political issues and the debate has been on for a long time. Implementation is however very dependent on political will. It is hence difficult to identify ways in which the AR4 can add value to the debate. If AR4 decides to tackle the equity issue it is important that it appreciates the political realities, while dwelling on developing frameworks that facilitate political acceptance of the need to achieve equity.

Furthermore, the Millennium Development Goals (MDG) project is developing analytical tools on how to achieve the MDG's. AR4 needs to take these into account.

General discussion:

One participant argued that the AM-SD integration is now being discussed not based on peer reviewed literature but rather of how policy making should be done or what it should take into account, but that this is not the mandate of the IPCC and/or the (C)LAs of AR4. This was countered by another participant saying that science has insights to offer on these relationships and that it is IPCC's task to present a comprehensive assessment. Equity is an important issue in that context. Also other participants were adamant that the AR4 authors must bring the debate on ethical issues closer by; and that it must be possible to do this in a policy-relevant fashion, without becoming policy-prescriptive.

V Elisabeth Malone (Pacific Northwest National Laboratory, USA): the climate dimensions of human change

Elisabeth Malone described the current approach to CC as linear moving from GHG emissions → atmospheric changes → climate change → impacts on natural systems → impacts on human systems → response through adaptation and mitigation, qualifying the approach as linear. She stated that in reality all of these steps will have feedbacks into other steps. So this linear approach is missing the complex interactions. She said that the arrows in the model should go from development stories to resulting population, affluence, and technology. Furthermore, the arrows should not just go one way, but both ways.

She further stated that climate is an important dimension in causing human change. Social sciences describe how people live their lives in specific places, what human resource needs are and how well those needs are being met; and why and how decisions are made that bear on resources. Therefore, measurable indices such as CO₂ emissions may not work. She wondered whether knowledge on CO₂ concentrations might help us to determine what is 'dangerous' (in relation to Art.2 of the UNFCCC) and to whom this would actually be dangerous? She emphasised the need to connect the question on "dangerous" to human change, i.e. to impacts of climate change on society. Elisabeth Malone admitted that a change in focus to *human change* will make things messy – but that the real world is messy.

She stated that the industrial revolution shows that big changes can happen (relatively) quickly, saying that it has to be understood why and how industries change and why and how people adopt new lifestyles? This can help understand how societies respond to the need for adaptation to and mitigation of climate change. Her key message was that there is a lot of relevant literature

on human change that can be applied very usefully in the context of a Development to Climate perspective.

Discussant: Richard Klein

Richard Klein said that the increased focus on humans in climate change vulnerability assessments reflects a change in the question that is being asked: initially, vulnerability assessments primarily intended to raise awareness, thus answering the question "climate change, so what?", while more recently they increasingly aim to answer the question "climate change: what to do?". According to Richard Klein answering this question requires a greater understanding of social, institutional and behavioural processes involved in adaptation and mitigation; knowledge that has been underrepresented to date in the IPCC assessment work. At the same time, it may not necessarily require more detailed projections of climate change. Richard Klein appreciated Malone's focus on the climate dimension in human change, as opposed to the human dimension in climate change. He argued however, that to frame the issue in this way does raise the question as to how we can make studying human change compatible with the current climate change policy regime, based as it is on targets and timetables and expecting practical guidance from the IPCC as to how best to meet them.

Discussant: Jiahua Pan

Jiahua Pan said that perhaps demographic change is one of the most important changes that influence the climate. Factors such as population growth, urbanization and aging are in general driving forces for climate change. The other category of human change is cultural and behavioural, often leading to a change of life style from basic needs satisfaction to luxurious and wasteful consumptions of resources or the other way round. The final one is the choice of development path, with long term implications on climate change.

VI Jim Fishkin (Stanford University, USA): New ways to consult the public on environment

Jim Fishkin stated that authors should take note of new literature on the role of opinion polling in discussions on decision making. Based on a new method of including stakeholder and general public views in decision making - the deliberative polling methodology- very different outcomes of decision making processes can be expected. In his method, he argued, people are informed and consulted appropriately, which is very different from the traditional opinion polling tools that have been used to inform decision makers. He illustrated this with case studies such as one on decision making on renewables in the portfolio of a Texas utility. Although utility decision makers had so far rejected calls for more renewables in their portfolio the deliberative polling exercise led to significant changes in their renewables policy, making the Texas utility one of the leading companies in the renewables area.

VII Tom Heller (Stanford University, USA): New perspectives in political economy and climate change

Tom Heller stated that AR4 should provide an analysis of a wider portfolio of approaches to climate change regime architectures. He wondered whether there is one single regime for multiple objectives: short, medium, or long term? And answered by saying "probably not".

He continued to say that there are two roads to SD: 1) climate (output) constraints, and 2) alternative development paths in input sectors. He suggested AR4 should focus on options for

input sectors, looking for *comprehensive sectoral solutions*. Tom Heller stated that if CC is treated separately, sectors will not pay attention to the messages solely related to climate and continue to conduct business on the basis of other considerations.

He also said authors should not only look at macro-economic optimization literature on analyzing options to deal with climate change, but also use political economic literature that analyses sub-optimal situations as found in real worlds, including institutions and stakeholders; this latter literature may be very relevant.

Discussant: Stewart Cohen

Stewart Cohen wondered whether shared learning (such as applied in the case of deliberative polling) can make mainstreaming easier. Further questions were: is there enough literature on sectoral, institutional and other social issues, relevant to addressing climate change, which can be assessed? And can such literature help us determine the border between what is tolerable and what is dangerous?

Discussant: Terry Barker

Terry Barker stated that political economy takes the responses of sectors and decision makers to climate change into account and that this indeed would provide better insight in the chances of implementation of adaptation and mitigation actions and of changes in development policies to make them more sustainable. He continued by saying that humans traditionally are good at coping with climate variability and adapting to change – e.g. clothes, houses, air-conditioning, etc. and one should not be surprised that adaptation is seen as a first resort.

With respect to mitigation he said that this is a different issue. There are only a few mechanisms to prevent GHG emissions: the main one is reducing fossil fuel use. This means that resources such as oil reserves are influenced by climate change mitigation policy, whilst other resources are not being influenced. Therefore, we are faced with the costs resting on mainly one sector (fossil fuel) and being immediate. Benefits on the other hand are cross-sectoral, global and long-term, e.g. the agricultural sector benefits from mitigation because the need to adapt to changing climate is being reduced. He concluded by saying that there is an opportunity for rapid change as there are few decision-makers to convince, and that we need observe intently what the energy sector response is.

VIII John Robinson (University of British Columbia, Canada): Climate Change and Sustainable Development: changing the lens

John Robinson emphasized three ironies: although climate change has been extensively reviewed, it is always claimed that more science is needed; although extensive consensus exists, the science is still perceived as uncertain; although many mitigation and adaptation options exist, a political gridlock prohibits progress. Perhaps new approaches are needed.

John Robinson stated that looking from SD to CC represents a different lens than the traditional approach of looking from CC to SD, which leads to a very different perspective. This perspective highlights the importance of the underlying socio-economic development pathways that give rise to emissions and also to mitigative and adaptive capacity. This is the lower right quadrant of Figure 1 in the Third Assessment Report Synthesis Report (see figure above) that is not explicitly addressed by an IPCC WG.

The key policy question raised by the new lens is how to achieve a low emission and low vulnerability development pathway. He described a number of new literatures that are relevant to that discussion, and argued that practical ways need to be found to integrate that material in the fourth assessment report. According to John Robinson, some of these new disciplinary areas to cover are:

- business and sustainability
- program evaluation/policy assessment
- behaviours, attitudes, values and information
- institutional change
- resilient communities
- participatory processes
- valuation and metrics

...whilst the context for literatures is:

- innovation and technological change
- trade liberalization and globalization
- socio-cultural and religious issues
- capital theory (social, natural, human, etc.)
- ecosystem-based management & complex systems analysis
- ethical issues
- science/policy linkages

Discussant: Tom Wilbanks

Climate change is indeed a profoundly serious issue, but it is not the most important of all issues for the well-being of the people and the ecosystems of the world over the next century (compared, for example, with technological change or rapid urbanization). This Reunion meeting shows that, in AR 4, the IPCC leadership is shifting the focus away from implications of climate change for its own sake to implications of climate change for sustainable development; and we are finding that this is in fact very appropriate and useful. It is leading us to ask somewhat different questions about climate change, e.g. about variances and extremes, impact thresholds, and multiple-objective contexts, including development paths. It is making it impossible to consider either mitigation or adaptation apart from the other. For instance, adaptation is more feasible if mitigation keeps climate change to a moderate level, and a "tolerable" stabilization level for GHG concentrations is higher in a more adaptable world. Finally, we are finding that the climate change issue provides an additional benefit by serving as a catalyst for attention to broader sustainable development issues and a stimulus for resources for addressing some of these issues, even if they are not directly related to climate change per se.

Discussant: Leena Shrivastava

Leena Shrivastava argued that addressing CC should be more inclusive but that changing the lens shouldn't mean we move away from CC. She warned against too dramatic diversion from 'normal IPCC practice'. Practically, she stated that adding John Robinson's list of 'new scientific disciplines' would put an enormous burden on the authors of AR4. She argued we need to concentrate on what is useful from a CC perspective to avoid being too inclusive. She asked the question what we want to draw from this literature.

Day 2 & 3: Break-out Groups and their results

The breakout sessions took place on Thursday 17 February and the morning of Friday 18 February. All participants were invited to join these breakout group discussions.

The groups discussed the consistency, complementarity, conciseness and completeness of the WG chapter outlines and zero order draft (ZOD) texts of WG II and III with regard to the interrelations between Adaptation-Mitigation and Sustainable Development.

The deliverables were:

- Issues to be addressed by WG II writing team at their second lead author meeting (LAM2) in Cairns , 14-17 March 2005; and,
- Issues to be addressed by the WG III writing team for completion of the ZOD by 11 March 2005.

The group was divided into 3 breakout groups, each dealing with a set of chapters from WG II and WG III:

	Group A	Group B	Group C
	<i>Sectoral / Regional dimensions</i>	<i>Adaptation - Mitigation</i>	<i>Sustainable Development</i>
<i>WG II chapters</i>	3,4,5,6,7,9,10,13,16	2,18,19	17,18,19,20
<i>WG III chapters</i>	4-11	1,2,3,11	2,12,13

The groups used an output table to try to find the overlaps, gaps and linkages between the discussed chapters. After the meeting, these tables may be used by the authors to further incorporate the AM-SD issues into AR4.

Results from the Break-out groups

Friday afternoon, each group presented its outcomes during the closing plenary, which resulted in the following conclusions:

- There was a general feeling amongst authors that the interactions with their counterparts from the other Working Group were very useful and would certainly lead to a better and more coherent treatment of AM and SD in AR4
- There seemed to be a general feeling that the current slate of authors may not be qualified or broad enough to assess the ‘new literatures’. A need was identified to bring ‘new’ expertise on board related to *inter alia*, SD economy, aid/development (as the alleviation of poverty is a prerequisite to achieve SD), equity specialists, and costing specialist, in particular in the area of SD.
- It was also felt that some of the broader concepts, e.g. adaptive / mitigative capacity, need to be defined, even though reluctance was noted as diverting views exist on these concepts and their application.

Breakout Group A: regional and sectoral chapters

Presentation by Lenny Bernstein: “AM-SD in industry”.

He stated that industry is vulnerable to the impacts of climate change, particularly to extreme weather events and potential changes in water availability. However, industry is also vulnerable to steps taken to mitigate climate change, i.e., government regulation and changes in consumer preference. The challenge for industry is to develop the adaptive capacity to respond to both climate change and changes in government regulation and consumer preference. Some companies and industrial sectors are developing this capacity by instituting GHG management systems, developing GHG inventories, and undertaking R&D to develop new products and processes. The link between adaptation and mitigation is close and obvious in the industrial sector.

Several WG II regional chapters were not represented at the meeting (chapters 1, 2, 3, 5, 6, 8, 11, 12, 14 & 15); this has limited the discussion on these chapters. The most important findings are given below.

- In some of the sections of the ZODs AM and SD need to be elaborated more extensively; this was the case for WG II chapters Water (3), Food and fibre (5), Coastal zones (6), Health (8), N-America (14), Europe (12), Australia & New Zealand (11) and Polar regions (15) in particular.
- Many regional A-M gaps were identified that need to be addressed. This goes for both the chapters that were represented at the meeting, as well as for the chapters that were not represented. These gaps include e.g.: Mitigation of agricultural emissions in Asia by adaptation practices (10), the relation between land use change and GHG emissions for agriculture (8) and cost-benefits analysis of avoiding deforestation (9).
- WG II links to Chapter 12 of WG III, titled Sustainable Development and Mitigation. Many WG II chapters do have potential linkages and overlaps with this WG III chapter.
- WG III links to Chapters 18 and 20 of WG II in the same way as the previous bullet.
- How to structure SD in the chapters of both WGs? Some more discussion is needed to decide which issues about SD should go into which chapter.
- Since SD is not a precise term (not defined), it complicates the writing. Using the terminology “making development more sustainable” does not make it much easier
- There are many linkages between WG II and III on two themes in particular: bio-energy/fuel and water.
- The link between WG II chapter 20 (adaptation side of SD) and the regional chapters of WG II can be elaborated through case studies. Such cases could explain how the higher conceptual level translates in the regions and/or sectors.
- WG III chapter 8 and 9 (respectively agriculture and forestry) were not well reflected in the outcome, yet this is often the area where A and M come together.
- The use of non-peer reviewed literature will be necessary.

Breakout Group B: Adaptation – Mitigation

Presentation by Terry Barker: “How do we represent/communicate adaptation/mitigation linkages?”

- Problems with flow chart in TAR (overemphasis on adaptation; implies adaptation can solve all problems; boundary between development pathways and impacts; no feedbacks included; mixed stocks & flows; no limits to adaptation): replacement diagram proposed.

- Similarities and differences between mitigation and adaptation characteristics, particularly noting issues of scale. We noted that however adaptation funding could still be global.
- Mitigation reduces the amount of adaptation we need to do and thus its cost but adaptation does not reduce mitigation costs.
- Mitigation reduces uncertainty but adaptation is end of pipe

Presentation by Rachel Warren: “communication tool for adaptation/mitigation potentials”

- Diagrams showing how damage reduced by adaptation and by mitigation
- Questioned validity of idea of optimal mix of M & A.
- Discussion on how diagrams vary as function of sector, of time, and of development pathway.
- No metric to be used; no numbers to be used. Care needed not to oversimplify.

Presentation by Ferenc Toth: “decision- analytical tools”

We distinguish between “decision making frameworks” i.e. representations of the process of decision making, which may be iterative and decision-analytical tools which evaluate policy options and thus support decision-making.

- Overview of tools to analyse trade-off between mitigation and adaptation
- Cost benefit analysis
- Cost effectiveness analysis
- Tolerable windows approach

Major conclusions from breakout group B on A-M:

- Prioritisation of A-M linkages and synergies is needed
- There is a link between WG II, chapter 19 and WG III, chapter 9 on reforestation, avoiding deforestation and mangroves. This should be better incorporated.
- A-M time scales are very different.
- More attention should be paid to “balancing A-M”; where is the breakeven point?
- There is a gap in literature about A-M mixes and the regional variation in this.
- General text on global, national and local synergies between A-M has many overlaps (WG II chapters 17, 18, 19 and WG III chapters 2 and 12).
- Where there is potential overlap between WGII & III, in WGII work from adaptation perspective whereas in WGIII work from mitigation perspective.

Breakout Group C: Sustainable Development

Presentation by Kirsten Halsnaes: “SD and Climate Change Framework”

In addition to figure 1, Kirsten Halsnaes presented an alternative diagram on the relations between Climate Change and SD, based on the well known Pressure-State-Impact-Response model. Her figure includes three state areas, namely the Climate system, the Natural system and the Socio-economic system. GHG emissions are a pressure to the climate system, and climate change becomes a stress to natural systems. The stress on the natural system changes the state of the system, and thereby also the ecological services such as resources for agriculture and fishery, aesthetic values and water resources provided to the socio-economic system.

Some issues raised in Group B also got attention in Group C: how to address/interpret SD

Specific to the cross-cutting theme SD, the following remarks and questions were raised:

- How to interpret the concept “development pathways”.
- A consistent conceptual framework on how AM and SD work together is needed. After the breakout groups on Friday, a meeting has been held on diagrams. As much as ten diagrams or more have been listed that are currently being used. These will have to be discussed in the near future (preferably via the VCG site) and be harmonised to a limited number of diagrams that can be used throughout WG II and III. The process of developing these diagrams will bring out conceptual differences of opinion between authors of how best to approach particular subjects.
- WG II, chapter 20 should look thru the Adaptation window, whilst WG III chapter 12 should look thru the Mitigation window.
- WG II lacks a framing chapter parallel to chapter 2 in WG III: the location of framing issues should be made clear (possibly in chapter 17-20).
- WG II chapter 17 and 20: policy issues related to Adaptation in chapter 20 should move to chapter 17, and mainstreaming issues in chapter 17 should move to chapter 20.
- The spatial disaggregation is not solved: what scales will be discussed; local SD, national, regional, etc.

Future work

The following steps were agreed by the group for follow-up of the discussions:

- The “virtual coordination group (VCG) on WG II-III AM-SD issues will be the vehicle to carry out the follow-up work. The TSUs of WG II and III will facilitate this group. A work plan needs to be developed for this group. The elaboration of this work plan and the implementation of this plan will be coordinated by Saleem Huq (WG II) and John Robinson (WG III).
- The work plan should contain the following actions:
 - Next three weeks:
 - Elaboration of common conceptual graphics;
 - Start discuss overlapping glossary; and,
 - Distribute output tables to all WG II and III authors.
 - Next few months:
 - The incorporation of the Reunion Island tables (see Appendix C); and,
 - The internal review of the WG III ZOD by WG II (28 April – 23 May).
 - Next few years:
 - The identification and sharing of literature sources between WG II and III;
 - A discussion platform / “chat-room” facilities will be provided to the authors; and,
 - A continued interaction between WG II and III authors until completion of AR4.
- The responsibility for the final text remains with the chapter teams.
- The expected results are that in 2007, AR4 will include new material on AM integration and will show new practical roads to SD. Last but not least, the virtue of this exercise is that WG II and WG III will send consistent messages to policy makers.
- It was agreed by the participants that the results of this meeting were important and will contribute to the authors’ work during the next LAMs and future work throughout the preparation of AR4. A request was to organise a similar meeting, possibly also involving

WG I authors, to carry on the coordinating work. This will be considered by WG II/ III depending on the availability of resources.

Official closing session

The official closing session was attended by Mrs Brigitte Girardin, Minister of French Overseas Departments, Mr President Vergès of the Regional Council of Reunion Island, Mr Mohamed Abdulhamide, Minister of Environment of the Comoro Islands, Mr Dominique Vian, Prefect of Réunion Island and Dr Pachauri, Chairman of the IPCC.

Appendix A

Programme of the meeting

WEDNESDAY 16 FEBRUARY 2005

9.00 – 10.00 h: KEYNOTE SESSION PART I

- Introduction by Bert Metz, Co-chair of IPCC WG III: background, objectives and deliverables
- Janos Pasztor, Coordinator Sustainable Development Program, UNFCCC Secretariat, Germany: “Policy needs for assessment of integration of adaptation, mitigation and sustainable development”

10.30 – 11.15 h FORMAL OPENING SESSION

- Opening address by **Paul Vergès**, President of the Regional Council of Reunion Island; President of the French National Observatory on the Effects of Climate Change
- Welcome words by **Dominique Vian**, Prefect of the Reunion Island
- Opening address by **Rajendra Pachauri**, Chairman of the Intergovernmental Panel on Climate Change
- **Marc Gillet**, General Director of the National Observatory on the Effects of Climate Change, France, “Some issues on interactions between climate change policy and sustainable development in France”

11.20 - 13.15 h KEY NOTE SESSION PART I (CONT.)

- **Michael Glantz**: Senior Scientist, Environmental and Societal Impacts Group, National Centre for Atmospheric Research, USA “Why good climates go bad”
- **Kirit Parikh**, Indira Gandhi Institute of Development Research (IGIDR), Member Planning Commission, Government of India: “Development from a Southern Perspective”
- **Mohan Munasinghe**, vice chair IPCC, Munasinghe Institute for Development, Sri Lanka, “Practical approaches for integrating adaptation and mitigation measures into a national development strategy”

14.45 h – 18.10 h: KEY NOTE SESSION PART 2

- **Elisabeth Malone**, Pacific Northwest National Laboratory, USA: “Climate Dimensions of Human Change”
- **Jim Fishkin**, Stanford University, USA: “New Ways to Consult the Public on the Environment”
- **Tom Heller**: “new perspectives in Political Economy and Climate Change “
- **John Robinson**, University of British Columbia, Canada: “Climate Change and Sustainable Development: Changing the Lens”

THURSDAY 17 FEBRUARY 2005

9.00 – 9.15 PLENARY BRIEFING ON BREAKOUT SESSIONS

9.15 – 17.00 h BREAKOUT SESSIONS

Announced presentations:

Group A: Lenny Bernstein: “links between AM-SD in Industry “

Group B: Terry Barker: “Climate change, A and M: an integrated approach”

Group C: Kirsten Halsnaes: “SD and the climate change framework”

17.00 – 18.00 h PLENARY SESSION – FEEDBACK FROM GROUPS

FRIDAY 18 FEBRUARY 2005-01-20

8.30 - 10.15 h BREAKOUT SESSIONS

10.45 – 12.30 BREAKOUT SESSIONS, preparation plenary presentations (block 5)

14.00 – 14.30 h CLOSING CEREMONY

- **Mme Brigitte Girardin**, Minister for Overseas Departments, on behalf of the Government of France, closing address
- **Paul Vergès**, President of the Regional Council of Reunion Island, closing address
- **Rajendra Pachauri**, chairman IPCC, closing remarks

14.30 – 16.00 h PLENARY CLOSING SESSION

- Presentations of Breakout groups
- Wrap-up and follow-up actions by session co-chairs

16.00 h CLOSURE OF THE IPCC EXPERT MEETING

Appendix B

Participants List

WG	Chapter	Name	Institute	Country
2	20	Q.K Ahmad	Bangladesh Unnayan Parishad (BUP)	BANGLADESH
3	2	D. Ahuja	National Institute of Advanced Studies	INDIA
3	11	T.S. Barker	University of Cambridge	UK
3	7	L.S. Bernstein	L.S. Bernstein & Associates, L.L.C.	USA
3	TSU	S. Brinkman	RIVM	NETHERLANDS
2	20	S.J. Cohen	University of British Columbia	CANADA
3	10	C. Diaz	Ministerio de Ciencia, Tecnologia Y Medio Ambiente	CUBA
3	11	J. Drexhage	International Institute for Sustainable Development	CANADA
3	Bureau	I. A.R.E. Elgizouli	Higher Council for Environment and Natural Resources	SUDAN
3	9	E.A. Elsidig	University of Khartoum	SUDAN
Speaker		J. Fishkin	Stanford University	USA
2	13	C. Gay-Garcia	Lic Francisco Estrada Porrúa	MEXICO
Speaker		M. Gillet	Observatoire National sur les Effets du Réchauffement Climatique	FRANCE
Speaker		M. Glantz	National Center for Atmospheric Research	USA
3	2	K. Halsnaes	UNEP Risoe Centre	DENMARK
3	12	T.C. Heller	Stanford University	USA
2	18	S. Huq	IIED	UNITED KINGDOM
3	5	S. Kahn Ribeiro	Federal University of Rio de Janeiro	BRAZIL
2	18	R.J.T. Klein	Potsdam Institute for Climate Impact Research (PIK)	GERMANY
3	9	O.N. Krankina	Oregon State University	USA
3	8	P. Kumar	Institute of Economic Growth	INDIA
3	12	F Lecocq	The World Bank	FRANCE
Speaker		E. Malone	Pacific Northwest National Laboratory	USA
3	co-chair	B. Metz	RIVM	NETHERLANDS
3	TSU	L.A. Meyer	RIVM	NETHERLANDS
3	13	A. Michaelowa	Hamburg Institute of International Economics	GERMANY
2	17	M.M.Q. Mirza	University of Toronto	CANADA
Vice chair IPCC		M. Munasinghe	University of Colombo	SRI LANKA
2	16	L. Nurse	Ministry of Physical Development and Environment	BARBADOS
2	9	A. Nyong	University of Jos, Plateau State	NIGERIA
chair	IPCC	R.K. Pachauri	Tata Energy Research Institute (TERI)	INDIA
3	12	J. Pan	The Chinese Academy of Social Sciences (CASS)	CHINA
Speaker		K.S. Parikh	Integrated Research and Action for Development (IRADE)	INDIA
Speaker		J. Pasztor	UNFCCC Secretariat	GERMANY

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3	Bureau	R. Pichs-Madruga	Centro de Investigaciones de Economía Mundial (CIEM)	CUBA
2	4	J. Price	California State University	USA
2	19	A. Rahman	Bangladesh Centre for Advanced Studies (BCAS)	BANGLADESH
3	6	J. Rilling	CSTB Building Research Center	FRANCE
2 and 3	18 resp. 12	J.B. Robinson	University of British Columbia	CANADA
3	12	J. Sathaye	Lawrence Berkeley Nat. Laboratory	USA
2	TSU	C. Sear	Hadley Centre for Climate Prediction and Research	UNITED KINGDOM
3	2	P.R. Shukla	Indian Institute of Management, Ahmedabad (IIMA)	INDIA
3	12	Y. Sokona	Sahara and Sahel Observatory (OSS)	TUNISIA
co-anchor SD		L. Srivastava	TERI	INDIA
3	12	R.J. Swart	RIVM	NETHERLANDS
2	18	F.L. Toth	IAEA	AUSTRIA
3	TSU	E. Trines	Treeness Consult	NETHERLANDS
3	3	R. Warren	University of East Anglia	UK
3	4	N. Wamukonya	UNEP Division of Policy Development and Law	KENYA
2	7	T.J. Wilbanks	Oak Ridge National Laboratory	USA
2	10	S. Wu	Chinese Academy of Sciences	CHINA

Appendix C

Overview of chapter linkages between WG II and III.

WGII		WGIII	
Chapter	Links to WGIII Chapter(s)	Chapter	Links to WGII Chapter(s) ...
All	12	All	18
1	-	1	19, 20
2	-	2	2, 3, 6, 7, 17, 18, 19, 20
3	-	3	2, 17, 18
4	9,	4	7, 9, 10, 11, 12, 13, 14, 15, 16
5	-	5	4, 7, 9, 10, 11, 12, 13, 14, 15, 16
6	-	6	7, 8, 9, 10, 11, 12, 13, 14, 15, 16
7	4, 5, 6, 7, 10, 11	7	3, 7
8	-	8	4, 5, 9, 10, 11, 12, 13, 14, 15, 16
9	4, 8, 9	9	4, 5, 9, 10, 11, 12, 13, 14, 15, 16
10	4, 8, 9	10	3, 7, 8
11	-	11	4, 8, 9, 17, 19
12	-	12	20
13	4, 5, 8, 9	13	17, 20
14	-		
15	-		
16	4, 10		
17	2, 12		
18	2, 3, 11, 12, 13		
19	2, 8, 9, 12		
20	2, 12		