

Adapting to climate change: a challenge and an opportunity for development

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The recent release of the approved Summary for Policymakers reflecting the Working Group II (WG II) contribution to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC AR4) (<http://www.ipcc.ch/SPM6avr07.pdf>) has clearly laid before us the evidence that climate change and development must be intrinsically linked.

The WG II report confirms that impacts of climate change are apparent on all continents and that these impacts will increase with the magnitude and rate of climate change. The report concludes that the most vulnerable are the marginalized ecosystems (coral reefs, sea ice, tundra, mountains, low-lying coasts, and low-latitude agricultural systems) and the people who depend on them. It goes even further to indicate that the most vulnerable people are among the poorest of the poor and include the poor in both developing and developed countries.

In the context of adaptation, the IPCC WG I (<http://www.ipcc.ch/SPM2feb07.pdf>) and WG II reports both clearly show that we are already committed to unavoidable climate change that will play out over the next 30-40 years and beyond. This commitment to

change, along with the observations that changes experienced to date are visibly impacting on natural, managed and human systems and that more impacts are expected as a result of those changes in climate, necessitates a commitment to adaptation. Mitigation, although essential to reduce, delay or avoid future impacts, will not effectively address those to which we are already committed.

The need for adaptation is particularly acute considering the nature of our vulnerability and the projected changes that will determine our future vulnerabilities as individuals and as a society. The livelihoods of most people, particularly those in developing countries, are critically dependent on a highly variable and changing climate. Single extreme events in some countries can cause setbacks

IPCC Fourth Assessment Report

The Intergovernmental Panel on Climate Change (IPCC) was established by WMO and the United Nations Environment Programme to assess scientific, technical and socio-economic information relevant for the understanding of climate change, its potential impacts and options for adaptation and mitigation.

In 2007 the IPCC will finalize its Fourth Assessment Report: Climate Change 2007. The reports by the three Working Groups provide a comprehensive and up-to-date assessment of the current state of knowledge on climate change.

The Physical Science Basis—A Summary for Policymakers (Working Group I) was released in Paris on 2 February 2007.

Climate Change Impacts, Adaptation and Vulnerability—A Summary for Policymakers (Working Group II) was released in Brussels on 5 April 2007.

Mitigation of Climate Change—A Summary for Policymakers (Working Group III) was issued in Bangkok, Thailand, on 4 May 2006.

The Synthesis Report integrates the information around six topic areas. It will be issued at the 27th session of the IPCC in November 2007 in Valencia, Spain.

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equivalent to a decade's worth of economic growth (Burton, 2006). As such, development and poverty reduction are often being prevented as a result of the variability and extremes of climate. Additionally, achievement of the Millennium Development Goals (MDGs) will be possible only if climate variability and change are managed more effectively.

The adaptation-development nexus manifests itself in a number of dimensions. First of all, we are not as well adapted as we should or could be to today's climate variability and extremes. This is blatantly obvious considering the nature of losses we are currently experiencing as a result of extreme weather and climate events. It is evident that the environment and human society have always experienced losses as a result of extreme events. Although

we have learned from some of these, individuals and society continue to make decisions that sustain or enhance their exposure to losses from extreme events; and society and the environment continue to pay and lose. Many of these decisions are associated with development or a desire to maintain or return to the status quo. They result from incomplete information on the nature of the associated risk or a desire to maintain or return, following an extreme event, to the status quo.

Secondly, the climate is changing and the amount and rate of change are projected to be significant in terms of human experience. In addition, those changes include not only those in the mean but also those in extreme weather and climate events (e.g. changes in intensity and frequency). As indicated in the second part of IPCC AR4 (WG II),

these extremes have the potential to cost humanity dear in terms of life, property and social, economic and environmental sustainability.

Finally—and, in some cases, more importantly than others—these changes in climate are concurrent with societal changes and developments. Many of these are contributing to society's increased vulnerability. Prominent amongst these societal changes are greater numbers of people relying on the same resource base and greater densities in existing and developing urban centres. Compounding the resulting enhanced risks is that many of these increases in numbers and density are occurring in areas where there is already high climate risk (low-lying coasts, river deltas and Africa (particularly the sub-Saharan region) or where those risks are also heightened through further development for human activity (e.g. coastal development, deforestation, more intensive use of available water resources, and development in the Arctic).

The impacts resulting from changes in climate and in society's vulnerability have already manifested themselves in all-too-obvious ways. Social, economic and environmental losses associated with an exposed and thus vulnerable society are mounting and threatening both our sustainability and potential for further development. Furthermore, development and reconstruction to address losses resulting from extreme events that do not consider projected changes in climate within their design and implementation are simply setting the stage for future losses and thus for perpetuating the commitment to further setback in economic growth.

The way forward is apparent—integrate adaptation and development. This necessity should be delivered both in terms of ensuring that development includes adaptation to climate change and that adaptation is consistent with development priorities (Klein *et al.*, in press). This dual

United Nations Millennium Development Goals

WMO, through global partnership in capacity building, training, education and public awareness at all levels, contributes to mobilizing support for international action to address climate change. It provides active support to the achievement of the UN Millennium Development Goals (MDGs) of eradicating extreme poverty and hunger, and of ensuring environmental sustainability through a vast reservoir of expertise and knowledge, among its Members states, Programmes, Technical Commissions, partner institutions and organisations. Regional Climate Outlook Forums initiated and supported by the WMO in different parts of the world, for example, provide an effective mechanism for capacity building at the regional level, particularly in developing countries.

It is the ambition of the WMO and the Millennium Development Goals to halve the loss of life associated with natural disasters of meteorological, hydrological and climatic origin over the next 15 years. The WMO has established a Natural Disaster Prevention and Mitigation Programme to ensure optimization of WMO's global infrastructure and integration of its core scientific capabilities and expertise into all relevant phases of disaster risk management decision-making at the international, regional and national levels, particularly related to risk assessment and early warning systems.

Extract from: Concept paper on the role of WMO and NMHSs in the implementation of the Nairobi Work Programme (<http://www.wmo.int/pages/documents/CONCEPTPAPERfinal.pdf>).

complementarity is reflected in the concept of mainstreaming adaptation. It includes addressing climate change as part of development planning and the consistency of development planning with climate change, so as to ensure the long-term sustainability of proposed developments and investments in the context of future climate and socio-economics.

What is this adaptation and how can mainstreaming adaptation be achieved? The Intergovernmental Panel on Climate Change defines adaptation as “an adjustment in natural or human systems in response to actual or expected climatic stimuli (variability, extremes, and changes) or their effects, which moderates harm or exploits beneficial opportunities” (IPCC TAR, 2001).

Adaptation responses and decisions can be categorized as measures and strategies that contribute either to:

- **Building adaptive capacity**—creating the information (research, data collecting and monitoring, awareness-raising), supportive social structures (organizational development, working in partnership, institutions), and supportive governance (regulations, legislation and guidance) that are needed as a foundation for delivering adaptation actions; or
- **Delivering adaptation actions**—actions that help to reduce vulnerability to climate risks or to exploit opportunities.

These two categories reflect the range of adaptation measures and strategies from which a good adaptation response can be developed.

Targeted measures directed at building adaptive capacity are fundamental to delivering responsive adaptation actions. Many organizations have begun the process of building adaptive capacity through understanding

the nature of the issue and risks, identifying and engaging the community/players, and assessing the situation (risks and thresholds) and likely adaptive responses.

In terms of willingness and ability to adapt (i.e. to make and/or implement a decision to adapt), these are often affected by concerns related to real or perceived barriers or constraints that can lead to questioning the need for adaptation or are seen as limiting the effectiveness of a particular option. These constraints or barriers include:

- Limited understanding of nature and extent of risks and vulnerabilities—current and projected
- Lack of supportive policies, standards, regulations and design guidance—deficiencies, encouraging status quo and/or presenting impediments
- Existing legal or regulatory restrictions
- Lack of availability or restricted access to appropriate technologies

- Prohibitive costs of identified adaptation options when budgets are limited
- Lack of availability of human capital (e.g. availability of in-house expertise)—conflicting priorities impeding access
- Social/cultural/financial rigidity and conflicts (existing or perceived)
- Short-term nature of decision-making and planning horizons—necessity and expectation of realizing return on investment; and
- Lack of acceptance of the need to adapt related to perceptions of uncertainty such as:
 - Lack of buy-in of need to adapt by decision-makers—business case has not been made and the mismatch between business planning horizons and timeframe of projections of climate change
 - Not seen as a big problem and the temptation is to wait for the impact then react



Adaptation to climate change is crucial in all parts of the world but especially in developing countries.



Adapting to climate change means adapting to the occurrence of more frequent and more intense natural hazards.

- Belief that the uncertainty is too great to warrant taking adaptation
- Lack of useful precedents or evidence of adaptation actions; and
- Lack of acceptance or understanding of risks associated with implementation—what if the decision is wrong?

In an environment of change, sustainability requires that society needs to be adapting. As long as change continues, adaptation will be necessary. Thus, building adaptive capacity is essential and fundamental to sustainability and development. Building adaptive capacity through improving the understanding of climate change and associated risks and specific vulnerabilities, along with actions related to understanding and improving the institutional and legal frameworks (i.e. those constraining or enhancing adaptive capacity), are useful strategies for eliminating most if not all of the barriers identified above.

Experience has shown that certain strategies and measures can be instrumental in establishing the basis for adaptation. Arming individuals and organizations with the information, tools and guidance to better

understand the risks and to identify and assess adaptation options are among the most effective of these. Access to climate information of sufficient quality and quantity is fundamental to understanding the climate risks, as well as identifying and assessing the viability of adaptation options. Regrettably, for many, the necessary climate information is not accessible or available and the deterioration of the climate observational network and that information which does exist (e.g. accessible climate archives) are perpetuating this deficiency.

Concern for the poor and deteriorating state of climate observations and of the accessibility to the resulting information led the Conference of the Parties to the UN Framework Convention on Climate Change to invite the Global Climate Observing System to organize a Regional Workshop Programme to facilitate improvements in climate observing systems, particularly in developing regions (Decision 5/CP.5). This programme in turn led to the development of Regional Action Plans in 10 distinct regions to address these priority needs (<http://www.wmo.ch/web/gcos/gcoshome.html>). Implementation of these action plans is now essential to building

the information base and capacity required to deliver adaptation and, thus, the development agenda.

It is also been recognized that, along with information on climate risks, knowledge of the impacts of exposure to those risks can be instrumental in motivating organisations and communities to begin the process of adapting. Memories are often short and communication from those dealing with the impacts of climate variability and extremes on a day-to-day basis with those developing policies and strategies and controlling budgets is often fragmented. Better understanding (and documentation) of the nature and extent of the impacts, including costs of repairing and restoring operations (e.g. UKCIP climate and impacts profile (<http://www.ukcip.org.uk>) can be a significant lever for change.

Experience has also shown that it is essential to make available tools and guidance that can be used by those seeking to address their climate risks. A wide variety of tools and guidance has been, and is being, developed by organizations at the global level (e.g. World Bank and UNDP) and nationally both in developed and developing countries. Information on these tools and guidance is being assembled through the Nairobi Work Programme (UNFCCC Decision 2/CP.11; see also http://unfccc.int/files/meetings/cop_12/application/pdf/sbsta_26.pdf) within the UNFCCC's Subsidiary Body on Scientific and Technological Advice (SBSTA) and will be the subject of an experts' workshop that will be held prior to the 28th session of the SBSTA (2008).

Experience has shown that several factors are fundamental to determining the success of these tools and guidance. Foremost amongst these are the following:

- Developers and users should work together to develop, test/evaluate and keep up to date specific tool or guidance material;

- Case-studies demonstrating the use of a tool or guidance material are essential; and
- Training can contribute to the successful adoption of a tool or guidance material, as well as to their further development (e.g., building of case studies and tailoring for specific use).

To be continually effective/sustainable, development will need to include a capacity to adapt. This capacity includes evolving with changing internal and external circumstances. As such, development like adaptation should be approached as a continuous improvement process. Climate, together with socio-economics, is a major determinant of success for much of the development required. The scientific evidence before us indicates that this fundamental determinant will continue to change, as will the associated risks and/or aversions to those risks. The viability

of development initiatives must be examined in the context of change and include adaptation to those changes.

The projected nature of climate change and the resulting impacts suggest that development will need to be periodically reassessed and improvements to existing measures or additional or alternative measures implemented in the light of those changes and new knowledge and technologies. This continuous improvement process provides an opportunity to incorporate lessons learned through implementation and living with previous adaptation efforts, including those undertaken by others, as well as technological innovations and increased scientific understanding. An opportunity that is realizable when those experiencing the changes and expected to implement and maintain the resulting development effort are engaged throughout the entire process. Experience has also shown

that key to sustaining the benefits of this type of development is that these same people are informed and have access to tools and guidance material, as well as the capacity to continue adapting well.

References

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