WMO Conference on

Living with Climate Variability and Change: Understanding the Uncertainties and Managing the Risks

Espoo, Finland, 17 – 21 July 2006

FINNISH METEOROLOGICAL INSTITUTE

The International Research Institute for Climate and Society

World Meteorological Organization

Weather • Climate • Water

Conference overview

The WMO Conference, co-sponsored by the Finnish Meteorological Institute (FMI) and the International Research Institute for climate and society (IRI), on "Living with Climate Variability and Change" was a result of the request made by the Fourteenth World Meteorological Congress in 2003 to the Secretary-General of WMO: to organize a multidisciplinary conference on decision processes in climate applications, designed to ensure that the outcomes and recommendations were applicable to the roles and functions of the National Meteorological and Hydrological Services (NMHSs).The overarching aim of the Conference was to review the opportunities and constraints in integrating climate risks and uncertainties into decision-making in sectors including Agriculture, Water Resource Management, Human Health and Disease Control, Energy and Built Environment and Disaster and Early Warning.

The Conference brought together climate scientists and user communities, to collate the experiences of public and private organizations worldwide that have been engaged in managing risks, and to build a framework for future strategies. During the opening ceremony, the Secretary-General, Mr Michel Jarraud, delivered a statement which put the Conference into the context of the wider WMO role of providing leadership in ensuring that society benefits from opportunities afforded by climate and develops the capacity to cope with adverse impacts of climate variability and change. Prof Jeffrey Sachs, Director of the Earth Institute at Columbia University, gave the Conference address. The Conference drew on the experience presented by renowned scientists and leaders from private and public organizations. The main results of the Conference are contained in the 'Espoo Statement on Living with Climate Variability and Change', included in this overview.

Among the many issues discussed was the need for improvement of policy formulation and operational decision-making in Agriculture, Water Resource Management, Human Health and Disease Control, Energy and Built Environment and Disaster and Early Warning. It was agreed that improvement would be achieved through widespread use of climate information in managing risks and exploiting opportunities. It was recommended that collaborative mechanisms be developed that facilitate needs- and supply-driven activities.

The event was a great success, judging from the feedback from the 264 participants who expressed appreciation for the opportunity to present their views, to share their experiences and to learn the capabilities and constraints of climate scientists. A unique feature of the Conference was that the user sectors led the discussions in determining their climate needs.

The success of the Conference owes its credit to the many donor agencies, participants, lecturers and organizers and to the Government of Finland playing an excellent host for the event.

A full report of the Conference, as requested by the World Meteorological Congress, will follow.

Extract from the Statement by Mr M. Jarraud, Secretary-General of WMO, at the Opening Ceremony of the Conference

Climate is a splendid resource. Nevertheless, while benefiting from its rewards we are quite vulnerable to its variability, hence the WMO resolve to optimize societal response to climate variability and change.

Today, climate can no longer be taken for granted, since:

- Societies are becoming increasingly interdependent;
- The climate system is changing;
- Losses associated with climatic hazards are rising.

Much of the time, climate anomalies are natural features of our climate system, so individuals, communities, and nations must constantly adapt to its slow changes and find ways to develop in harmony with nature. As scientists, however, we recognize many uncertainties in climate, and it is precisely to address these uncertainties that the Conference was organized: to highlight the main issues in integrating climate information with the mainstream of decision-making and to formulate recommendations on possible solutions for dealing with the uncertainties and the associated risks.

Why is climate-related risk management imperative? Essentially all human societal activities are in peril, since climate risks threaten our assets, procedures and financial viability. These issues are even more critical in the developing countries and the Least-Developed Countries, since the concept of climate risk might not even be considered, for example, in their standard

insurance portfolios of options for companies and sectors, and so a climate-related disaster might signify a catastrophic failure of the entire national economy.

Faced with the disturbing prospect of having to live with climate variability and change, the achievement of a clear understanding of all the uncertainties and risks involved becomes a fundamental requisite. In 1979 WMO organized the First World Climate Conference and launched its World Climate Programme in response to growing concern being expressed with increasing emphasis by climatologists and to observational results indicating possible changes in the global climate. Since then, and for more than a quarter of a century, WMO has been working proactively in response to the challenges being posed by this problem.

These are some of the activities that WMO is implementing within its role of providing world-class expertise and leadership in international cooperation, as the United Nations Agency with mandate in weather, climate and water. They are actions that contribute positively to human safety and well-being and to the economic benefits of all nations, bringing us closer to realizing a major WMO objective: that of halving by 2019 the 1994-2003 ten-year average of deaths caused by disasters of meteorological and hydrological origin. In addition, these actions are also supportive to the achievement of the UN Millennium Development goals of eradicating extreme poverty and hunger and of ensuring environmental sustainability.

Mr Michel Jarraud, Secretary General of WMO (Right) and Prof Jeffery Sachs, Director, the Earth Institute at Columbia University, USA, interacting with the media during the Espoo Conference.

Espoo statement

The participants of the WMO Conference, co-sponsored by FMI and IRI, on "Living with Climate Variability and Change", held in Espoo, Finland July 17-21 2006, being experts in natural disasters, public health, energy and the built environment, water resources, agriculture and food security, decision-related sciences, and policy and climate, declare as follows:

We recognise that every major social, economic and environmental sector is sensitive to climate variability and change, both of which are significant factors in each sector's sustainable development.

We agree that policy formulation and operational decision-making in climate sensitive sectors will be improved by more widespread use of climate knowledge and information in managing risks and exploiting opportunities (collectively referred to as climate-related risk management).

We recognise that the process of developing effective climate-related risk management works best if it is:

- driven by the needs and requirements expressed by relevant decision sectors
- developed within real-world decision contexts
- enabled through facilitating institutions and policies
- based on environmental, sectoral and socio-economic data
- based on tailored climate information
- supported by local capacity
- included in planning strategies that incorporate incentives

- supported by sector-specific services from National Meteorological and Hydrological Services and related institutions.

We note that climate-related risk management requires multidisciplinary collaborations and the cross-disciplinary exchange of information, such as can be achieved through interfacing institutes and processes.

We believe that on-going collaboration at national and regional scales between sectoral partners and climate information providers will benefit all parties. We note further that the practice of climate-related risk management is not widespread within many sectors and that there is a lack of awareness of climate-related risk management opportunities among numerous communities that would benefit.

We recognise the need for efforts to assemble disparate knowledge, to identify good practice, and to assess the value of and give visibility to climate-related risk management.

We recommend that collaborative mechanisms be developed that facilitate needs and requirements driven activities in climate-related risk management, and that they be used to improve the quality of climate-related risk management to the benefit of all.

These mechanisms could promote:

- evaluation of current climate-related risk management in all relevant sectors
- better assessments of the value of climate-related risk management
- establishment of data sets necessary to inform decision making
- research to improve climate-related risk management
- development of decision-support tools
- capacity building in climate-related risk management
- on-going evaluation of outcomes
- the use of suitable financial mechanisms in support climate-related risk management.

We request that these recommendations be considered by WMO, other UN System organisations, and sectoral and development organisations operating at national, regional and international levels.

Steve Zebiak, Director, IRI and Elisabeth Lipiatou, European Commission, in the foreground, other participants, and Pekka Plathan, Director, FMI, at far right during the conference

Extract from the Conference Address by Prof Jeffery Sachs, Director, Earth Institute, Columbia University

It is significant that the Conference is taking place during a period in which the world has been experiencing more intense climate shocks more frequently, and yet there is no proper interface, even at an intellectual level, where societal knowledge in policy, economics or demography and the knowledge of Meteorology is considered. There is therefore an intellectual task ahead of understanding how to interface the scientific aspects of a changing climate with the societal context in which the changes will take place throughout the world, and then what we can do about it. Effects of any shock or variability in climate depends very much on community social baselines in terms of household capital, community capital, infrastructure, Government reserves, natural capital and hazard risks.

The roles of climatic processes are often not recognized in human crises. Yet the underlying or major contributing causes of many human crises, such as the violence in Darfur, Sudan and the collapse of governments in Ecuador and Indonesia, can in large measure be triggered by a single or sequence of weather related events that can in turn precipitate massive ecological and demographic challenges for the country or region affected. The conflict in Darfur, for example, is in fact a consequence of a reduction of rainfall and the doubling of the population of the region in the last 25 years, in an area, which is already semi-arid, i.e. with an existing baseline of water stress. The roots of the violence relate to the ecological disasters of 1980's when shortfalls of water led to conflict between pastoralist and farming communities. These root causes are neither understood nor appreciated, and so the solutions proposed to resolve the crisis are often a mix of military and humanitarian relief; such solutions clearly do not address the baseline water issue, which is the fundamental problem.

Each community, national government, meteorological service and emergency response organization needs to make a checklist of the typologies of risks they face, the baseline exposures, and the potential for responding, so that the vulnerabilities of each society can be analysed and mapped. This process is very complicated and therefore, there is no single agency, department or intellectual discipline that can sufficiently capture the plots of interacting forces that are at play. There is a lot of data needed to establish the baselines. There is therefore, the need for more openness and flexibility in the sharing of data.

The array of risks in the vulnerability typology includes: Hydrological risks (droughts, floods, mudslides, pollution of fresh water aquifers); Heat stress risks (affecting human health and crop yield); Diseases; Pests; Storms; Sea level. Developing this list is important for the purposes of modelling vulnerability.

The next important step is the consideration of response. This step has to include consideration of:

- Reduction of vulnerability through weather forecasting, climate prediction and early warning systems;
- Creation of buffers:
    - Financial, which include financial stocks or lines of credit that are sensitive to climatic shocks.
    - Physical, which include water storages, erection of sea walls, and protection and improvement of ecosystems, e.g. through reforestation;
- Insurance - different insurance companies and the World Bank are developing risk management products that are weather-linked;
- Diversification - in economic activities and, for farmers, diversification in crop types;
- Relief and resources - Post shock relief is an area in need of much improvement.

It is not sustainable for any government to depend on the endless goodwill of others. There are delays sometimes exceeding one year from the time of the climatic shock to when action is actually taken. International relief agencies need buffer resources to allow them to be more responsive in an emergency.

Migration of people running from misery has not always been facilitated with due consideration of the dignity of the migrants. This is one of the more difficult choices for the international community.

This Conference could start the process of rendering or interpreting these processes so that we can begin to develop expert systems that will help the mapping of vulnerabilities and responses in a more thorough, organized and decentralized way.

Additionally, within the MDG initiative, there is a global structure called the Poverty Reduction Strategic Process (PRSP). This is the process through which a developing country relates to its donors, and climate considerations are not well integrated, if at all. There is a need to include into the PRSP both ecological and environmental knowledge, a further task the Conference was challenged to consider. WMO, IRI, World Bank and the private insurance sector can play a role together in creating a range of technical and financial instruments that would serve at least one aspect of the required response.

Lead Speakers

Felipe Lucio, Director, Mozambique National Institute for Meteorology, Mozambique (Disasters and Early Warning).
Mike Muller, Witwatersrand University School of Public and Development Management, South Africa (Water Resources)
Ramesh Jain, United Nations Resident Coordinator and FAO Representative to the Philippines, India (Agriculture and Food Security)
Anthony McMichael, Director, National Centre for Epidemiology and Population Health, Australian National University, Australia (Human Health and Disease Control)
Rajendra Pachauri, Chairman, Intergovernmental Panel on Climate Change (IPCC) and Director-General, The Energy and Resources Institute, India (Energy and the Built Environment)
Ann Henderson-Sellers, Director, World Climate Research Programme (WCRP), WMO (Climate Science: What do we know?)
John Zillman, President, Australian Academy of Technological Sciences and Engineering, Australia (Long term planning and Development)
Maxx Dilley, Policy Advisor, UNDP Disaster Reduction and Recovery Unit, Switzerland (Risk assessment and risk management)
Gordon McBean, Chair, Institute for Catastrophic Loss Reduction, University of Western Ontario, Canada (Inter-disciplinary applied research)
Esko Aho, President, Finnish National Fund for Research and Development, Finland (Promoting change through innovation)
Petteri Taalas, WMO, Switzerland (Natural disasters and climate change in developing countries)
Markku Rummukainen, Rossby Centre, Swedish Meteorological and Hydrological Institute, Sweden (Regional climate scenarios)

Conference Sponsors

- Finnish Meteorological Institute (FMI)
- International Research Institute for climate and society (IRI)
- World Meteorological Organization (WMO)

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- Academy of Finland
- Bureau of Meteorology, Australia
- European Commission
- Finnish Ministry of Foreign Affairs
- Finnish Ministry of Trade and Industry
- Finnish Ministry of Environment
- Meteo France
- National Oceanic & Atmospheric Administration, USA
- UK Met Office

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