International Conference
"Climate change: a challenge or a threat for water management"
Amsterdam, The Netherlands
September 27-29, 2004

Reported by Tetsuya IKEDA

Day 1: September 27, 2004

Dr. Henk van Shaik, Chair of the Program Committee opened the Conference by introducing the film "The Heat in On: Better be prepared", which reported the changing climate in recent years and its impacts on water resources such as floods and droughts. In this film, the importance of the dialogues and adaptation strategies was emphasized.

Mr. Jong, Conference President made a welcoming speech, in which he tendered his acknowledgement to the key members such as conference speakers and explained the objective of the conference. Mr. Reiter, Executive Director of International Water Association (IWA) also made a welcoming speech. Ms. Schultz, State Secretary of Public Works and Water Management introduced the Netherlands' policy on water and climate. She highlighted a new Dutch policy named "giving water more space" in response to the expected impact due to climate change, introduced the new EU "High water initiative", and put importance on the interdisciplinary approaches to involve all the concerning sectors and stakeholders.

Dr. Cosgrove made a keynote speech on "Managing water in face of climate variability". He introduced increasing occurrences of extreme floods or droughts from the scientific point of view, and exemplified the changing climate by showing the change in typhoon paths as was reported at the Typhoon Committee meeting in Korea. He put importance on combining the coping strategies: "Resistance strategy: enhancing the infrastructure level (enhancing water storage capacity, for example)" with "Resilience strategy: by enhancing recovery from impacts through building capacity". Finally he introduced a new initiative Cooperative Programme on Water and Climate (CPWC) that would promote awareness and conduct advocacy campaign.

A representative from WMO advocated the necessity of improving accuracy of climate prediction as well as down scaling prediction to the basin or local level. He introduced the WMO's initiative on climate information to water managers and emphasized the importance of bridge building between climatologists and water managers.

Mr. Komen from Royal Netherlands Meteorological Institute (KNMI) made a keynote speech introducing the on-going climate observation (WWW, GCOS, CEOS, IGOS, GEOSS, and Earth Observation Summits, EU Framework program) and climate research (WCRP, IGBP, IHDP, ESSP, ESF, and Netherlands initiatives). He also presented the projected climate scenario for the Netherlands concerning temperature, precipitation, river discharge, drought level, and sea level rise by showing the simulated change of rainfall. He concluded that a series of studies of global climate system would be required and we just began to understand climate change.

Session 1: Scientific evidence of changes in climate on hydrological systems

In the afternoon session, a representative from EU made a presentation that EU prioritized climate change and sustainable use of natural resources and that the EU Water Framework Directive required flood prevention as well as achieving good water status by 2015. Concerning with water and climate issues, he presented the EU Framework Programme that included EUROCAT (catchments changes and their impacts on the coast), SWURVE (Sustainability Water: Uncertainty, Risks and Vulnerability), CLIME, PEOMISE, PRUDENCE (prediction of regional scenario), MICE (modeling), EFFS (flood forecast system) and CARPE DIEM. He also introduced the new 6th Framework Program (2002-2006) that included EUROLIMPACTS AQUATERRA and NEWATER. To conclude, he emphasized the importance of effective early warning and forecasting systems as well as water resources management through integrated risk-based approach. The presentation titled *"The impact of environmental change on water systems at the global level and the challenges for research"* was made by Germany (www.gwsp.org), which exemplified the changes in global water resources induced by human activities, and highlighted the Global Water System Research Program and its link to international networks of regional studies such as HELP, GEWEX, and EU NEWATER.

"Precipitation variability in the Meuse basin and its linkage to atmosphere circulation" by UNESCO-IHE tried to reveal climate variability by statistical precipitation analysis, which identified the change in intensities of daily precipitation. *"Spatial variability of trends in hydrological extremes induced by orographically enhanced rainfall events due to westerly atmosphere fluxes"* from Luxemburg highlighted the statistically significant increasing trends of winter rainfalls due to western fluxes and of the maximum daily stream flow in winter, and its role of topography in the spatial variability. *"Modeling the impact of climate change on drought in the Netherlands"* by Institute of Inland Water Management and Waste Water (RIZA) assessed the situations of drought through hydrological model analysis. *"Climate change and the effect on hydrology and water management in the Rhine basin"* introduced the roles of International Commission for the Hydrology of the Rhine (CHR) and the outcomes of the Workshop in 2003 which was aimed at disseminating the findings on water and climate, and emphasized the necessity to synthesize the findings of the different research groups.

Day 2: September 28, 2004

Session 2: Impacts of changes in climate on water resources

Mr. Reiter chaired the morning session, where the following presentations were made. *"Climate change, ecosystem and biodiversity"* by Wageningen University highlighted the effect on species distribution and change in phenology due to temperature rise (for example, in Kenya mosquitoes are now shifting to high lands, which had never been seen before). *"Effect of climate variability in Patzcuaro lake: an historical review and*

hydrological modeling" from Mexican Institute explained a correlated analysis on historical series of evaporation, temperature and rainfall gave the delimitation to climate trend. *"Future increase in harmful algal bloom in the North Sea due to climate change"* by National Institute for Coastal and Marine Management (RIKZ) presented the result of analysis which showed climate change would increase harmful algal bloom, especially summer species. *"Climate change and drinking water production in the Netherlands"* by KIWA Research Institute presented the envisioned impacts on water supply system and addressed its flexible strategies to cope with climate change such as water treatment techniques and securing seasonal storage. *"Climate change and the biodiversity in wetlands"* by National Institute of Public Health and Environment (RIVM) estimated the decrease in wetland areas due to the reduced river discharge by using the simulation models in some rivers of the world.

Session 3: Forecasting and vulnerabilities

In the afternoon, Dr. Briceno, Director of UN-ISDR chaired the session, and briefed about the roles of ISDR and the World Conference to be held in Kobe next year. The following presentations followed were made. *"Early warning"* from EU Joint Research Center introduced the European Flood Alert System (EFAS) and its relevant LISFLOOD run-off model. *"Flood vulnerability index (FVI)*" presented the progress in the development of the FVI to assess flood risk by using key factors. *"Estimating thousand-year extremes from seasonal forecast model archives"* from KNMI tried to simulate accurately extreme and large-scale weather events (long-term return period) through the ECMWF seasonal forecast system.

Centre for Ecology and Hydrology (CEH), UK presented the development of *"Climate vulnerability index"* designed to identify the vulnerability and to prioritize actions by combining physical and socio-economic data. The index's effectiveness was illustrated from the exemplified several cases. *"Preparedness for climate change"* from Netherlands Red Cross stressed the approaches to reduce climate risks such as assessment, awareness raising, and partnerships etc were necessary. *"Effect of climate change on waterborne disease in the Netherlands"* from RIVM revealed the increasing peak concentration of waterborne pathogens in surface water. *"Some principles for risk sharing and financing adaptation"* from Institute for Environment Studies (IVM) emphasized the necessity of future funding for climate change adaptation. *"International Flood Network (IFNet) and Global flood alert system (GFAS)"* from Infrastructure Development Institute (IDI) introduced the system of distributing the E-mail flood alert messages to the world through the network of IFNet and the outcomes of GFAS.

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Session 4: Coping processes and options

"Climate change and water management and protection Plan in Emilia-Romagna"

from Italy presented the anticipated impacts of climate change, the current study programs in Italy, and the coping strategies in the Emilia-Romagna basin. *"Risk management of flooding problems in Polders"* from Delft Technical University presented the measures that they would take for future damages in the polders and examined their cost effectiveness. *"Development of perspective based water management strategies for the Rhine and Meuse basin"* evaluated the different management styles of the basin. RIZA presented "Climate change and urban drainage" in which the anticipated impacts on urban drainage systems and its envisaged measures such as securing storage capacity and damage prevention methods were introduced.

"Flood management under the climate variability and its future perspective of Japan" by Mr. IKEDA, PWRI reviewed the flood management and recent extreme floods in Japan, and introduced its planed activities concerning water and climate as well as a new initiative to establish a UNESCO Center on water related hazards. *"Adaptation strategies in the urban environment"* by IVM exemplified several infrastructures/ methods such as flood proofing or amphibious houses to reduce flood loss and to adapt to climate change.

Nile basin Netherlands Partnership

The presentations were made from the riparian countries of the Nile. *"Impact of the Sudd wetland"* presented the change of water cycle by using the regional climate model. *"Groundwater and storage"* introduced the management aquifer recharge and subsurface storage system (MAR-SSS). *"Sand dams: a catchment ground water storage approach in arid lands"* from Kenya explained the effectiveness of sand dams through recharge mechanism between wet season and dry one. *"Climate change in the Nile basin"* by Delft Hydraulics presented the water use of Lake Nasser and the impacts of climate change. The UNESCO-IHE made the presentation on the current activities in the East Africa and the Nile basin, introducing the Nile basin capacity building Network, AfricaNet, Research network of Makerere University Uganda, and the planed workshops & training courses.

At the end, "Conference summary" was discussed and adopted. It included "Introduction", "Focus areas" (the development of scientific evidence/ substances especially on a regional & local level, methodology of forecast, early warning system and policy options to support decision-making) and "Summary of each session". Prof. Meganck, Director of UNESCO-IHE made a closing remark, where he emphasized that the outcomes of the conference would catalyze the relevant UN families for further actions, and put importance on combining the strengths of the relevant scientists, water sectors and disaster communities and bringing the messages to the political arena. He also referred to the planning of the new UNESCO Centre in Japan, in expecting the future partnership. Finally the Conference Chair gave a closing address and expressed his appreciation to all concerned.