### Water Security

- Gretchen Kalonji, Assistant Director-General for the UNESCO Science Sector
- Rick Lawford, Senior Scientist, Morgan State University, US
- Ursula Oswald-Spring, Professor, Regional Multidisciplinary Research Centre (CRIM), National University of Mexico, Mexico, and Global Environmental Change and Human Health (GECHH) project
- Kuniyoshi Takeuchi, Director, ICHARM (International Centre for Water Hazard and Risk Management), Japan
- Abdou Ali, AGRHYMET (Centre Régional de Formation et d'Application en Agrométéorologie et Hydrologie Opérationnelle), Niger
- Dipak Gyawali, Chairman, Nepal Water Conservation Foundation and former Minister of Water Resources, Nepal
- Ben Braga, President of the forum committee of the 6th World Water Forum
- Karin Lexén, Director, Swedish Water House, Stockholm International Water Institute, Sweden
- Anil Mishra, Programme Specialist, International Hydrological Programme (IHP), UNESCO
- Aleix Serrat Capdevila, International Center for Integrated Water Resources Management (ICIWaRM-UNESCO); The University of Arizona

The session consisted of 3 keynotes and a panel discussion with 3 panel members. The session was opened by Dr. Gretchen Kalonji. In her opening remark she highlighted **Water Security: Responses to local, regional, and Global Challenges.** Dr. Kalonji stated that Rio+20 summit should recognize the role of water in achieving MDG and upcoming SDG (Sustainable Development Goals), but that it is also a main vehicle for a green economy.

Following are the key recommendations drawn from the keynotes, the panel intervention and from the interactive discussion session.

## #1: Link science and policy objectives through specific targets and monitoring.

Do relevant science focused on real world problems, and make it relevant through timely and opportune interactions with policy makers. Work towards science-based decision-making.

## # 2: For adaptive management practices, open governance of water to all relevant stakeholders. This requires participatory planning and management.

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Adopt approaches that integrate structured public participation, planning and management processes and strong scientific input, contributing to science based decision-making. Include the public, governments (decision and policy-makers), private sector and academia. Allow the empowerment of the population. Ensure an institutional willingness. Create capacity building and training.

# # 3: Fully Integrate Water Resources Management through the inclusion of relevant sectors (economic, land use planning, transportation, energy, agriculture), institutions and stakeholders. Integrate across scales and timeframes.

Do this from the local level to basin and regional scales. Iteratively monitor the impacts of decisions and policies so that management can be adaptive and ever improving. Assume this as a continuous process. Integrate environmental sustainability, social equity and economic efficiency.

# # 4: Analyze specific interactions between land ownership, management and water impacts to find where improvements can be made to promote water availability and quality.

Encourage investments in water infrastructure and technology that work towards that goal. Account and integrate linkages between water and food, energy and environmental security. Increase efficiency of water use and manage demand. Get more use from each drop of water to create more sustainable livelihoods.

### # 5: Manage to conserve the health of ecosystems and maintain their ecosystem services.

Ecosystem services provide wealth. Do not fully appropriate available resources, which may lead to over-allocation of resources in times of change or scarcity (brittle systems). Provide buffers to accommodate change and capitalize on these in times of need (resilient systems).

### # 6: Communicate scientific uncertainty to the user community and stakeholders.

The concept of uncertainty will always be present, regardless of the amount of research and observations. The acceptance and quantification of different sources of uncertainty and their inclusion in water management and planning is essential. It is essential that notions of natural variability and uncertainty are well communicated to the user community, the stakeholders and the public.

#### # 7: Reduce the population exposed to natural water-related disasters:

Proposed goals are: (1) Halve the population without protection from hydro hazards below a 10 year return period. (2) Halve the population without access to the basic early warning for extreme hydro hazards. Define standard scales of measuring risk, preparedness and vulnerability, as well as systems to monitor and reduce risk. In the face of uncertainty, prepare for the worst.

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