

## A NEW APPROACH IS NEEDED

How can we ensure the well-being of all people and ecosystems with the water, human, technological, and financial resources available?

We must manage water more effectively and wisely by unlocking scientific, managerial, and business capabilities; breaking out of technological lock-in; and developing innovative and adaptive portfolios of solutions while removing barriers to progress on sound water governance.

The **Water Futures and Solutions (WFaS)** initiative is ground-breaking. ♦ It brings together cutting-edge science, dedicated policy, and innovative business across the economic sectors and the geographic scales in which water decisions are made. ♦ It is the first study to truly integrate the sectors and fully engage all stakeholders in developing and investigating a set of water futures with fully-consistent sector-specific analyses. ♦ It will identify robust and adaptive portfolios of optional solutions to current and future water challenges, and test these solution-portfolios with multi-model ensembles of hydrologic and sector models to obtain a clearer picture of the trade-offs, risks, and opportunities.

# WFaS



## PARTNERS & CONTRIBUTORS

### Initial partners

The WFaS initiative was started through a partnership of:

- ♦ United Nations Educational, Scientific and Cultural Organization (UNESCO)
- ♦ International Institute for Applied Systems Analysis (IIASA)
- ♦ Ministry of Land, Infrastructure and Transport (MOLIT), Republic of Korea
- ♦ International Water Association (IWA)
- ♦ World Water Council (WWC)

### Contributors (as of September 2013)

- ♦ Academy of Sciences Malaysia (ASM) ♦ Asian Development Bank (ADB) ♦ Austrian Development Agency (ADA) ♦ Bibliotheca Alexandrina, Egypt ♦ Center for Environmental Systems Research (CESR), University of Kassel, Germany ♦ Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australia ♦ Government of Hungary ♦ Gujarat Institute of Development Research (GIDR), India ♦ Helmholtz Centre for Environmental Research (UFZ), Germany ♦ Institute of Rural Management Anand (IRMA), India ♦ Institute of Geographic Sciences and Natural Resources Research (CAS), China ♦ Institute of Water Resources and Hydropower Research (IWHR), China ♦ International Food Policy Research Institute (IFPRI) ♦ International Water Management Institute (IWMI) ♦ Joint Research Centre (JRC) – European Commission ♦ Korean National Committee, 7th World Water Forum ♦ KWR Watercycle Research Institute, Netherlands ♦ The Millennium Project ♦ Ministry of Foreign Affairs, Norway ♦ National Institute for Environmental Studies (NIES), Japan ♦ National Institute of Hydrology (NIH), India ♦ National Natural Science Foundation of China (NSFC) ♦ Natural Environment Research Council (NERC), United Kingdom ♦ Norwegian Water Resources and Energy Directorate (NVE) ♦ Organization for Economic Co-operation and Development (OECD) ♦ University of Oxford, United Kingdom ♦ Potsdam Institute for Climate Impact Research (PIK), Germany ♦ South African Water Research Commission (WRC) ♦ The City University of New York (CUNY), USA ♦ Utrecht University, Netherlands ♦ Wageningen UR, Netherlands ♦ Walker Institute for Climate System Research, United Kingdom

# WATER FUTURES and SOLUTIONS

# WFaS



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WaterFutures  
4theWorld.

## WATER AT A CROSSROADS

Progress toward meeting global water challenges has not been enough:

- ◆ 770 million people lack access to improved sources of drinking water.
- ◆ 2.5 billion suffer from inadequate sanitation.
- ◆ 35 million die prematurely each year from water-related diseases.

The world's freshwater resources are under stress:

- ◆ 75% of the world's wastewater flows into the environment without treatment.
- ◆ 50% of the world's wetlands have disappeared over the last century.
- ◆ Climate change is affecting future water availability.

There is no alternative to water, but it becomes increasingly scarce as populations rise, wealth increases, and consumption soars:

- ◆ 70% and 15% of human freshwater withdrawals goes to agriculture and energy, respectively.
- ◆ If current trends continue, by 2050 there will be 60% and 100% more demand for food and energy, respectively.

Not surprisingly, major international forums as diverse as Rio+20 and the World Economic Forum are calling to make solving today's water challenges a global priority.

"We all know how complicated water is, and it is complicated because of the multitude of different stakeholders....

If the Water Futures and Solutions initiative can help to enlighten a few of the complexities of those relationships, it will be a big help."

Jack Moss, Secretary General, AquaFed, France

## USING GROUND-BREAKING SCIENCE

The Water Futures and Solutions (WFaS) initiative goes far beyond earlier water foresight studies. How?

- ◆ WFaS will develop qualitative and quantitative descriptions of water futures jointly with water policy planners and decision makers, while maintaining consistency with the scenarios developed in other sectors in other global processes. Scenarios inspire creative and innovative solutions—essential to tackle our growing water challenges.
- ◆ WFaS will be the first study to truly integrate the different water uses—agriculture, energy, industry, household and ecosystem—and apply multi-model ensemble analysis through all. For the first time, stakeholders will have the essential numbers to be able to prioritize competing needs, take advantage of synergies across all sectors, and understand the associated risks and uncertainties.

◆ WFaS will work consistently across different governance scales. Only through analyzing water challenges at multiple scales will city planners, for example, be able to understand the implications of their actions at the watershed or national or even global level, and for all water-using sectors. It also, importantly, reveals opportunities to apply tried and tested solutions in other areas with similar biophysical and socioeconomic settings.

Major outputs will be published at the 2015 and 2018 World Water Forums.

"The scenario approach in water would overcome the very traditional and classical approach which follows a business as usual line. Water scenarios are able to set new options, new possibilities, new foundations."

Fritz Holzwarth, Deputy Director-General, Ministry for the Environment, Nature Conservation and Nuclear Safety, Germany

## TO FIND INNOVATIVE SOLUTIONS

WaterFutures 4theworld—the solutions-oriented part of WFaS—will bring theory to practice in challenging pilot projects.

### Business opportunities

- ◆ Assessments of the potential role of using existing technologies more widely and of developing revolutionary new technological solutions.
- ◆ Cost-benefit analyses of different management options and new business models identified through mapping water-related opportunities and risks for business.

### New water governance

The results of WFaS scenarios and models will provide a basis for long-term strategic planning of water resource development. And given the complexity of the water system, WFaS will uniquely provide policy makers with optional sets of solutions that work together and that can be easily adapted as circumstances change in the future. Just as recognizing that every dollar spent on pre-disaster infrastructure improvement is worth up to \$10 spent after a disaster, solving our water problems requires a long-term approach.

### Inspiring change

Water is also all about relationships. As WFaS progresses, it will establish a network involving information exchange, mutual learning and horizontal cooperation across teams of researchers, public and private decision-makers and practitioners exploring solutions at regional, national and local scales. In this way, it will also inspire a new generation of scientists and professionals to find innovative solutions.



"The Water Futures and Solutions initiative is very relevant given the fact that people are preoccupied with distributing water and making sure people have access to water and they are not paying attention to whether the water resources will be available in the future for distribution."

Munaaba Flavia Nabugere, Minister for the Environment, Uganda