



## CLIMATE CHANGE

Climate change impacts will hit us first through water

Higher temperatures and changes to other climate variables are leading to sea level rise as well as changes in wave climate, coastal environments, availability and quality of water for irrigation and other water demands. An increased hazard of extreme events such as storms, heavy rainfall and periods of drought and water scarcity is also expected. The scale and nature of projected changes varies across the globe. This necessitates local analyses as well as timely and effective responses to ensure resilience to such changes.

Responses to climate change are twofold – and they must go hand in hand. They include mitigation of the high concentrations of greenhouse gases and adaptation of human systems to changing climatic conditions.

### THE CHALLENGES

- Managing risks to population and infrastructure from sea level rise and changes in storm and rainfall intensity
- Managing changes in water availability and water quality
- Ensuring food and water security in changed climates and societies
- Developing renewable energy sources to mitigate greenhouse gas emissions

### OUR APPROACH

In order to adapt to climate change, society will need to ensure infrastructure resilience, sustainable water resources management, and provision of improved disaster management capabilities. All of these will involve decision-making under uncertainties. Our comprehensive expertise in water environments, in conjunction with our advanced downscaling techniques, can form a sound basis for decision-making. It also allows for the provision of adaptation measures, customised to local requirements.

### OUR SOLUTIONS

- Climate Change Decision Support System (DSS), based on downscaling of Global or Regional Climate Models, to project future climate conditions and associated uncertainties
- Unsurpassed experience in flood forecasting worldwide
- Flood risk assessment and management based on advanced modelling techniques
- Capacity building and training
- Integrated Water Resources Management (IWRM)
- Tailor-made IT systems for optimal water management (REAL TIME and PLANNING)

### THE ULTIMATE GOAL

CLIMATE CHANGE-RESILIENT INFRASTRUCTURE, ECONOMIES AND SOCIETIES

## OUR EXPERTISE

To help you manage the impact of climate change and develop efficient adaptation strategies, we provide services in the following areas:

### WATER RESOURCE MANAGEMENT

- Climate Change Impact Assessment on Flood Risk
- Climate Change Impact Assessment on Water Resources
- Water quality and freshwater ecosystems
- Adaptation measures
- Adaptation strategies
- Capacity building

### URBAN WATER AND CLIMATE CHANGE

- Urban flood risk assessment and management
- National Adaptation Strategies
- Urban Adaptation Strategies

### MARINE WATER AND CLIMATE CHANGE

- Infrastructure design conditions
- Coastal flood risk assessment and management
- Climate change impact on coastal morphology
- Metocean data in a changing climate
- Climate change impact assessment on environment and ecology

We also support your climate change adaptation efforts with our services in:

### HEALTH RISKS AND SAFETY PLANNING

- Health risks from toxic bacteria
- Food safety

### RESEARCH AND DEVELOPMENT

- Climate change DSS
- Risk-based design in a changing climate
- Managing water scarcity
- Climate change impacts on coasts

## “ Warming of the climate system is unequivocal\* ”

\* Source: Intergovernmental Panel on Climate Change (IPCC)'s Fourth Assessment Report

## CASE STORIES



Large parts of Kenya are facing serious water scarcity. Climate change may further aggravate this situation. We helped the Water Resources Management Authority (WRMA) build adaptive capacity to climate change in this country. We worked toward two key objectives. First, to provide a better knowledge foundation of possible future climate change and its impact on the water resources. Second, to prepare a modelling tool supporting the planning of adaptation measures.



The Nile Basin is the main source of water in Northeast Africa and is under great stress due to water scarcity and conflicting uses. To anticipate the potential impacts of climate change on this already stressed environment, we helped to develop state-of-the-art climate scenarios and regional scale hydrological models. These will allow for the assessment of climate change impacts and adaptation potential in relation to floods and droughts.



Together with clients and organisations worldwide, we have been developing solutions for climate change adaptation for decades. We have compiled our comprehensive knowledge and experiences in three Guidelines. These provide a state-of-the-art overview. They also describe in detail the methodologies to be used to achieve sustainable climate change adaptation within the areas of water resources, urban water and marine water.

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