



The IAHR Project on Climate Change Impact on the Hydrological cycle, Water management and Engineering (CCHE)

PROJECT DESCRIPTION

Motivation

1 It is now well accepted that, in the light of the recent IPCC reports and the award of the Nobel Prize to the Panel, the vast majority of members of the scientific community are convinced that the climate is changing or at least will experience a significant fluctuation already during the current century. However it is perceived that some hydrologists, water experts and hydraulic engineers are not yet ready to incorporate climate change scenarios in their designs for such projects as:

- flood protection and river training,
- dam rehabilitation,
- water resources management under water scarcity and changes in the hydrological regimes.

2 In view of the above, it is important to investigate the extent and cause of this reluctance to incorporate climate change scenarios in designs and engineering feedback, and take appropriate action for promoting it, when appropriate.

Establishment of the Working Group

3 The IAHR Project on **Climate Change impact on the Hydrological cycle, water management and Engineering** (acronym **CCHE**) was established in October 2009, starting from an original idea formulated in October 2007 within the IAHR Applied Hydrology Working Group and contributions from the chairs of two other IAHR Working Groups. IAHS members contributed as well, after a possible cooperation with IAHS was explored in 2008 and 2009. The Project **CCHE**, an initiative of the Standing Committee of the Global Water Issues, was established with the endorsement of the IAHR President N. Tamai and the Executive Secretary C.B. George. *Members* of its *Scientific Committee* (SC) are:

Toshiharu Kojiri, Water Resources Research Center, Kyoto University, Chair of the IAHR Working Group "Climate Change"

Arthur Mynett, WL Delft Hydraulics, Chair of the IAHR Standing Committee "Global Water Issues".

Roberto Ranzi, University of Brescia, DICATA, Italy, Chair of the IAHR Working Group "Applied Hydrology".

The Scientific Committee had a virtual meeting with Internet and phone communication in October 2009 when this workprogramme was discussed and its basic points approved. The workprogramme was finalised in early November 2009, approved by T. Kojiri, A. Mynett and R. Ranzi.

4 It was decided that *Chairman* of the Scientific Committee will be Roberto Ranzi. IAHR members who will significantly contribute to the project's activities will become project's *partners*, after approval by the Scientific Committee. Others, who will participate to some of the project's activities will become *participants*.



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Objective

5 The objective of the project is to encourage a close co-operation between the scientific and engineering communities in taking appropriate and timely action in response to the impact of climate change on the hydrological regime and on water resource projects.

Expected outputs and products

6 The expected outputs are:

- Inventory of climate change *impact studies* and the engineering feedback for the *adaptation* to climate change impact on the hydrological cycle, and
- Scientific Report.
- Invitation to project's partners and participants to submit scientific papers to a Special Section or a Special Issue of a peer-reviewed journal.

7 The Members of the Scientific Committee will prepare and submit to the IAHR Council the Scientific Report on:

(a) the current state of knowledge as regards the *impact* of projected climate change on the hydrological regime in different regions of the world, where these regions are defined not just in geographic terms but also on the basis of their level of economic and water resources development;

(b) the extent to which these impacts are recognized and taken into account by national water authorities, engineering organizations and other regulating bodies in setting their standard practices and procedures for the planning, design and operation of water works. These *adaptation* measures will include both "hard" responses, such as the construction or enlargement of engineering structures, and "soft" responses, such as changes in legislation or the operating rules of existing structures.

7.1 The report will include recommendations on:

(c) what the climate and hydrological communities still need to do to overcome the reluctance of those responsible for designing and managing water projects to take account of climate change scenarios in their work, and

(d) if they do take these scenarios into account, what sort of response is considered appropriate on the side of the water engineering and management communities.

7.2 The Report will be in the order of 15-20 pages in length, including a one-to-two page Executive Summary and a Recommendation chapter.

7.3 The SC will make proposals as to what further work might be undertaken as a follow-up to the present project and who might undertake that work.

8 The Report will be accompanied by an Inventory of climate change impact studies including all the information used in its compilation and the names of the people and institutes contacted and supplied information. It will list existing projects, studies,



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directives, laws taking into account the impact of climate change on the hydrological cycle and water projects. This Inventory will be structured as a metadata base, designed as simple as possible and will be Web-based.

Allocation of responsibilities

9 The Chairman of the SC will be responsible of the design of the Web-based inventory and of a draft of a questionnaire to collect information on impact studies and adaptation measures. Partners and Participants to the project will submit to the SC the feedback to the questionnaires. All members of the Working Group will contribute to all aspects of the report, but there will be a need to allocate principal responsibility for topics/sections to individuals. Accordingly, work on the topic referred to under 7(a) above will be supervised by Toshiharu Kojiri and 7(b) will be supervised by Arthur Mynett, the three members of the SC concerned in each case deciding amongst themselves how to distribute lead responsibility for final reporting on sub-topics, for example, such as snow and ice or groundwater in 7(a) and flood control or irrigation in 7(b) - see the Work Plan below.

Work plan and milestones

2009

October: Design of a Questionnaire (version 1.0) template asking about studies related to topics 7(a) and 7(b).

November: Distribution of the Questionnaire to a selected list of researchers. Design of the structure of the Inventory metadata base and Web. (Milestone 1)

December: Analysis of the feedback, with comments and remarks.

2010

January-February: Revision, if needed of the Questionnaire (version 2.0) and distribution to a wider community of researchers, who will contact end users, authorities, engineering companies,... (Milestone 2). The Web-based, password-protected inventory will be opened. (Milestone 3)

March: The SC will monitor and briefly report about the state of the art of the inventory

October: The input to the Web will be closed.

November: The reporting by the SC will start.

2011

February: The SC will close the draft of the Scientific Report and distribute for peer review. (Milestone 4)



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June: The SC will send the Scientific Report and the text of the Recommendations to the IAHR Council for approval.

June – July: Presentation of the final Report and Inventory to the IAHR Congress in Brisbane for consideration of the Council leading to the final approval of the Report and Recommendations and decisions as to possible presentation to WMO, UNESCO, etc. plus decision of IAHR on the future of the project, including the journal for submitting the papers by the project's partners and participants.

August: Call for papers

2012

Publication of the Scientific Report (Milestone 5) and papers on a Special Section or a Special Issue to a peer-reviewed journal and the Inventory (Milestone 6). Dissemination of the project results.

November 2009.

Roberto Ranzi
Toshiharu Kojiri
Arthur Mynett