



# Promoting a Research Hub of Water Resources by Pooling Forces from CAS Institutes

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CAS inaugurated its Center for Water Resources Research in 2006 with an objective to bring together R&D resources housed in different CAS institutes so as to play a major role in the comprehensive, strategic, interdisciplinary and foresighted studies of water resources at the national level and in key regions. In light of China's strategic demands, the Center carries out macroscopic, strategic and comprehensive research, and strives to make synthesized findings that come from different CAS institutes but transcend those by a single

institute. It works hard to contribute to scientific management and rational utilization of water resources of the country at the macroscopic and strategic level and offer science consultancy to central decision makers. In addition, it regularly publishes a report series under the title of *Water Issues Vision in China* and conduct extensive exchanges and cooperation at home and abroad. Thanks to its five-year development, the Center has become a research hub featuring "a small core with a large network."



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## 1. Inauguration

As a basic natural mainstay with strategic and economic importance, water resources are an indispensable part of a country's comprehensive national strength. With its rapid population growth and soaring economic development, China has to face an increasingly serious shortage of water resources, which are considered one of the country's three key strategic resources, the other two being grain and petroleum.

As China's strategic research force, CAS enjoys the advantage of applied basic research and comprehensive regional studies in water resources, with more than 20 research institutes in the field. In 2003, Prof. LU Yongxiang, vice chairman of the Standing Committee of China's top legislature NPC and then CAS president, instructed that "the sustainable development of water resources in China is a major issue, and hence studies should be carried out on the feasibility to establish a new research body or a network at CAS to explore the subject." Three years later, he gave another written directive, urging the projected center for water research "to muster the scattered research forces working on their own research priorities and dispersed in different CAS institutes so as to provide support for the decision-makings of the national



CAS Vice President Prof. Li Jiayang and Vice Minister of Water Resources Hu Siyi jointly unveil the name-plaque of the Center.

authorities on issues concerning water management and control in a more macroscopic or more synthetic way." In order to give a full play to the synthetic and strategic research of CAS and its interdisciplinary and foresighted studies in this regard both at national level and in a key region, and in line with the third-stage plan of the Knowledge Innovation Program, the CAS Center for Water Resources Research was officially established in Beijing on December 3, 2006.

## 2. Orientation and functions

The Center is an S&T platform for conducting comprehensive research into key problems of water resources, a consultative center for national decision-makers on issues concerning water resources control and management, a high-level "forum on water resources" open

to the public, and a venue for cooperation and exchanges both at home and abroad.

In light of its orientation, the Center mainly fulfills the following tasks: (1) Working out plans for academic development and strategic schemes for scientific research



A group photo of the Steering Committee of the Center.



in the field of water resources; (2) Establishing a high-level supportive platform for scientific research; (3) Coordinating efforts to bid for key research initiatives sponsored by domestic or foreign agencies; (4) Undertaking key strategic advisory and planning projects for the central or local authorities and organizing a trans-institute and trans-department “national forum on water resources”; and (5) Promote exchanges and cooperation both at home and abroad.

By fulfilling those tasks, the Center performs the following three functions:

(1) *Combination and integration*. To bring together and concentrate research strengths housed in different CAS institutes in the field concerning water resources to storm R&D strongholds; and to set up a comprehensive research

platform on the subject by pooling equipment and data sources at CAS.

(2) *Interdisciplinary research*. To give a full play to the CAS merits in interdisciplinary research by mobilizing CAS research forces in various disciplines and carrying out trans-regional and trans-departmental programs of synthesized research in a wider perspective.

(3) *Synthesis and improvement*. To conduct strategic studies in a macroscopic and comprehensive way and to achieve research findings that come from research institutes but transcend those from individual institutes, so as to provide a sound groundwork for the macroscopic management, rational exploitation and scientific planning or assessment of China’s water resources.

### 3. Planning and construction

#### 3.1 A platform for synthetic & integrated research

The establishment of a platform for synthetic and integrated research on water resources will enable the Center to become a research hub featuring “a small core with a large network,” and guarantee the fulfillment of its integrative and synthetic functions. A main task of the Center is to link and consolidate research forces scattered in different research institutes to conduct comprehensive studies. In the circumstances of modern technology, a technical platform is necessary for consolidating research forces and conducting comprehensive studies. Through this platform, the Center could effectively pool research strengths in different disciplines and with varied priorities to form a joint research contingent capable of implementing synthetic research on major issues of water resources, hence playing the role of a research hub featuring “a micro core with a large network,” updating its functions as an institution for comprehensive, integrated and interdisciplinary studies, and achieving its goal. In addition, this technical platform will render support to the Center for conducting national research projects, offering consultant services for major engineering projects and developing national strategy for national water resource security. It will also promote integrated innovation of the research results in this aspect. Specifically, the technical platform is composed of: a comprehensive databank, a model and method library and knowledge base on water resources; application platforms for a coordinated research

network, for a policy-making supportive system, and for an information portal of water resources; and a multifarious service platform. With the support of CAS, the first-stage construction of the platform includes a comprehensive databank on water resources, an experimental platform for the simulation of artificial rainfall and a synthetic service platform on water resources.

#### 3.2 Scientific advisory reports

As a series of scientific advisory reports to be presented to the State Council and governmental departments, *Water Issues Vision in China* integrates water resources research with findings from consultative projects in line with major national demands. Focusing on urgent issues concerning water resources at present or in the future, the reports strive to offer scientific view points and countermeasures from a fundamental, synthetic and forward-looking perspective. As a major task and research outcome of the Center, the series synthesizes research results in this regard in line with national strategic requirements and by giving full play to the interdisciplinary advantages of CAS. By revealing major issues concerning China’s water security and exploitation, the series also provides scientific support and consultant service for the development of national strategy for water resources. Published regularly, the series is consultant reports on major strategic issues concerning water resources conducted by experts and scholars inside or outside CAS.



### 3.3 A venue for cooperation & exchanges

An issue holding the attention of every country in the world, water resources have become a hot-spot in scientific research. In order to promote research in this regard, we must strengthen the international cooperation and exchanges. As the subject is closely related to the national economy and people's livelihood, it is necessary to open this research to the public. The construction of a platform for synthetic & integrated research, including an information portal on the Internet, is a move to share and open information resources to the general public, so as to make the Center a high-level public forum on water resources as well as a venue for cooperation and exchanges at home and abroad.



At the founding ceremony of the China-Australia Water Resources Research Center.

## 4. Development

Under the title of “*the impact of climate change on the water resources in typical regions of north China and counter-measures for its adaptation*,” the first volume of the *Water Issues Vision in China* was off press in August 2011.

It expounds the changes of water resources in north China, the Yellow River valley, the Huai River Basin and some frigid and arid areas noted for their high fragility and sensitivity to global warming.

Based on long-term research and observation findings in the impact of climate change on water resources, this

report centers on the above-mentioned typical regions in north China with an extremely fragile water system that is most sensitive climate change. From the three perspectives of observation facts, the impact of climate change on water resources and countermeasures for its adaption, it defines major water resources problems vital to socioeconomic development, such as water security, grain security, flooding and drought calamities, the gigantic engineering project of water transfer from the south to north, and retreating and thawing of glaciers. Through



Participants in a China-Australia symposium held by the Center.



synthesizing and analyzing the problems from the point of view of climate change science, the report puts forward recommendations and proposals to address these problems, as precautionary advices to the authorities in response to the ongoing trend of global warming.

Thanks to its sound development over the latest five years, the Center's platform of international cooperation has been preliminarily shaped, including the China-Australia Water Resources Research Center, which was founded in February 2006; the China Committee of GWSP (Global Water System Project), which was inaugurated in 2004 and whose Asia Scientific Network Office is designed to promote the Center's joint research projects on large-scale exploration of key water-related

problems with other Asian countries by concluding new R&D partnerships. Since then, similar successes have been accomplished, such as the IAC-sponsored Water Program in China, the IAP-sponsored Water Program in China and the office of the International Water Resources Association (IWRA). Based on these platforms, the Center has succeeded in carrying out research initiatives of international cooperation, such as its joint research project with Japanese colleagues on the ecological soundness of rivers, and its enduring and fruitful partnerships with Australia's Melbourne University, National Academy of Sciences and National Academy of Engineering Sciences. In 2010, the Center's director was elected IWRA chairman.

## 5. Future priorities

In light of the national strategic demands and the grim situation of climate change, the Center proposes the S&T development approaches, strategic priorities and major research directions for China's water resources in the 12th Five-year Plan period: Conducting studies of water resources across the country with emphasis in north China, the Yangtze River valley and rivers in southwest China; conducting research into special issues of water resources such as cryosphere and international rivers; enhancing studies of the technological system for the monitoring and evaluation of engineering projects of water resources; strengthening the development and synthetic research of a national platform for forecasting and precautionary service on water resources security; reinforcing the interdisciplinary studies between

water resources, the environment and ecological sciences; upgrading China's research and innovation capacity in this regard so as to do a better job of providing knowledge, technical support and advisory service for decision-making concerning national water security.

In short, the Center will be committed to these research topics, which are actually major challenges to the fundamental and applied research in water science in the new era. By grasping the opportunity that hydraulic science has received higher priority from the central authorities, the Center will actively carry out studies in line with the national major demands (such water resources security) and fundamental issues at the world frontier (scientific issues in the water system).