

# Proceedings

of the 2nd International  
Yellow River Forum on  
Keeping Healthy Life of the River



黄河国际论坛  
2005 IYRF

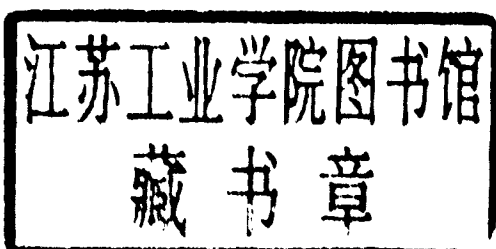
Volume I



Yellow River Conservancy Press

**Proceedings**  
**of the 2nd International Yellow River Forum**  
**on Keeping Healthy Life of the River**

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## Welcome

On behalf of the Organizing Committee of the 2nd International Yellow River Forum (IYRF) on Keeping Healthy Life of the River and Modern River Basin Management and the conference host, the Yellow River Conservancy Commission (YRCC). I warmly welcome you all over the World to Zhengzhou to attend the 2nd IYRF.

During October 21 ~ 24, the YRCC successfully hosted the 1st IYRF in Zhengzhou, China. There were more than 350 experts and scholars from 32 countries and regions to participate in the Forum. And 258 papers have been collected and published in four volumes of proceedings. The decision – makers, experts and scholars coming from different countries and regions had a wide exchange and dialogue and shared their ideas mainly focused on the central theme “The Modern River Basin Management and Experience, and Up – to – Date Technology Application In The 21st Century”. They put forward many valuable academic opinions and advanced experiences. It would give an active impulse to the river basin management.

The central theme of the second conference of IYRF is keeping healthy life of the river and modern river basin management. It is developed into six sub – themes: (1)keeping healthy life of the river; (2)integrated water resources management approach in the river basin management, and (3)application of modern science and technology; (4)structure and non – structure measures of river management; (5)water environment and ecological protection; (6) inter – basin water transfer technologies and water allocation; and water rights, water pricing and water markets. The Conference also arranges 12 special sessions jointly hosted by YRCC and the international known organizations as follows: special session on Global Water Partnership (GWP); special session on Co – operative Programme on Water and Climate (CPWC); special session of UNESCO – IHE; special session on Challenge Program on Water and Food (CPWF); special session of World Water Council (WWC); special session on CIDA Projects; special session on Sino – USDA Cooperation Project; special session of Sino – EU Cooperation Project; special session of Sino – Dutch Cooperation Project; ADB – PRC Water Week 2005; special session of World Meteorological Organization (WMO); and Challenge Program Theme 3 Workshop.

At present, more than 700 experts and scholars from 52 countries and regions have entered their names for participate in the Forum and submitted more than 350 papers. Through examine of the Scientific Committee, 280 papers are included in the proceedings of the 2nd IYRF. Compare with the 1st IYRF, the content of current conference is more

abundant and the form of sessions more multiform. The Conference will omni-directionally show the achievement on China's water conservancy and the Yellow River basin management, deeply discuss the focus and crux of river basin management, and hope to develop a mechanism for international cooperation and exchange more widely.

I am sure that with effort of the Advisory Committee, the Organizing Committee, the Scientific Committee and all of the representatives will benefit from the conference in the professional field, and be happy in life. I am also sure that your experience exchanged and your good suggestions for keeping healthy life of the river and modern river basin management in the conference will influence the management of Yellow River and other river basins in the world actively in future.

Finally, I hope that the 2nd IYRF will be successful, the conference will keep a deep impression to every participant, and every participant will be in good health and have a pleasant stay in Zhengzhou.

Li Guoying

Chairman of the Organizing Committee, IYRF

Commissioner of Yellow River Conservancy Commission, MWR, China

October 2005, Zhengzhou

## Foreword

The International Yellow River Forum (IYRF) is a great congress in the field of water resources, and also a good chance for scientists who are engaged in river basin management, hydraulic research and management to exchange and discuss the river basin management and the science of water. During October 21 ~ 24, the YRCC hosted successfully the 1st IYRF in Zhengzhou, China. There were more than 350 experts and scholars from 32 countries and regions to participate in the Forum. And 258 papers have been collected and published in five volumes of proceedings. The decision – makers, experts and scholars coming from different countries and regions had a wide exchange and dialogue and shared their ideas mainly focused on the central theme “the river basin management mode and experience, and up – to – date technology application in the 21st century”. They put forward many valuable academic opinions and advanced experiences and fixed the central theme of the 2nd IYRF on the Keeping Healthy Life of the River and Modern River Basin Management. It would give an active impulse to the river basin management.

The 2nd IYRF is held in October 16 ~ 21, 2005 in Zhengzhou, China. The central theme for the 2nd IYRF focus on:

### **Keeping Healthy Life of the River and Modern River Basin Management**

The central theme was broken down into following six sub – themes:

- A. keeping healthy life of the river;
- B. integrated water resources management approach in the river basin management, and application of modern science and technology;
- C. structure and non – structure measures of river management;
- D. water environment and ecological protection;
- E. inter – basin water transfer technologies and water allocation;
- F. water rights, water pricing and water markets.

The Conference also arranges 12 special sessions jointly hosted by YRCC and the international known organizations as follows:

- As. special session on Global Water Partnership (GWP);
- Bs. special session on Co – operative Programme on Water and Climate (CPWC);
- Cs. special session of UNESCO – IHE;
- Ds. special session on Challenge Program on Water and Food (CPWF);
- Es. special session of World Water Council (WWC);
- Fs. special session on CIDA Projects;
- Gs. special session on Sino – USDA Cooperation Project;
- Hs. special session of Sino – EU Cooperation Project;

- Is. special session of Sino – Dutch Cooperation Project;
- Js. ADB – PRC Water Week 2005;
- Ks. special session of World Meteorological Organisation (WMO);
- Ls. Challenge Program Theme 3 Workshop.

The preparation work for the 2nd IYRF was started after the 1st IYRF in October, 2003. About 350 papers have been received. Most of them were submitted by decision – makers, experts and scholars from 52 countries and regions since the Bulletin 1 issued. Total 280 papers were presented in 49 technical sessions and 6 plenary for general reports. All papers that have been selected for presentations are included in five volumes of the proceedings with titles in accordance to the contents of the six sub – themes of the 2nd IYRF as follows:

- Volume I: including 55 papers under the sub – theme A and B
- Volume II: including 58 papers under the sub – theme B
- Volume III: including 56 papers under the sub – theme B and C
- Volume IV: including 53 papers under the sub – theme C and D
- Volume V: including 58 papers under the sub – theme D, E and F

The papers presented at the special sessions (As ~ Ls) are also included in the above five volumes of the proceedings in accordance to their contents.

The Editors are indebted to the generous support of the co – sponsors: Global Water Partnership (GWP), Asian Development Bank (ADB), Royal Netherlands Embassy, Beijing (RNE), Challenge Program on Water and Food (CPWF), China International Center for Economy and Technical Exchange (CICETE), United States Department of Agriculture (USDA), Co – operative Programme on Water and Climate (CPWC), China Institute of Water Resources and Hydropower Research (IWHR), Tsinghua University, China (TU), Nanjing Hydraulic Research Institute (NHRI), Yellow River Water & Hydropower Development (YRWHDC), World Bank (WB) and International Economic Technical Cooperation and Exchange Center, MWR (IETCEC, MWR).

We would also like to acknowledge the financial supporters: Yellow River Conservancy Commission (YRCC), Global Water Partnership (GWP), Asian Development Bank (ADB), Royal Netherlands Embassy, Beijing (RNE), Challenge Program on Water and Food (CPWF), China International Center for Economy and Technical Exchange (CICETE), United States Department of Agriculture (USDA), Co – operative Programme on Water and Climate (CPWC), China Institute of Water Resources and Hydropower Research (IWHR), Tsinghua University, China (TU), Nanjing Hydraulic Research Institute (NHRI), Yellow River Water & Hydropower Development (YRWHDC), World Bank (WB), International Economic Technical Cooperation and Exchange Center, MWR (IETCEC, MWR) and GHD Consulting Co. Ltd, Australia.

We would also like to thank the members of the Advisory Committee, the Organizing Committee and the Scientific Committee, and the all authors presented in the proceedings

for their outstanding contributions.

We sincerely hope that the publication of the proceedings of the 2nd IYRF will give an active impulse to the keeping healthy life of the river and modern river basin management, and provide a much used source of reference for this kind of issues.

Shang Hongqi

General Editor and Secretary General

Secretariat of LOC, IYRF, YRCC

Zhengzhou, China, October, 2005

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