



WORLD ASSOCIATION OF SOIL AND WATER CONSERVATION

HOT NEWS

Issue 10, 2016



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Cover photo: Plant in Karst Area in Wayao Watershed, Guizhou Province, China.

Editors: Dr. Du Pengfei, Contributors include Prof. Li Rui and Dr. Qu Liqin.



IRTCES Building

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<http://www.journals.elsevier.com/international-soil-and-water-conservation-research/>

WASWAC Website: www.waswac.org

SPECIAL ISSUE For
The International Training Workshop on
River Basin Management Strategies and
Techniques for Soil and Water Conservation

International Training Workshop was Held Successfully

The International Training Workshop on River Basin Management Strategies and Techniques for Soil and Water Conservation was held successfully in Beijing from October 9 to 15, 2016. This training workshop was hosted by the International Research and Training Center on Erosion and Sedimentation (IRTCES), and co-hosted by the China Institute of Water Resources and Hydropower Research (IWHR) and the World Association of Soil and Water Conservation (WASWAC). The opening ceremony was held on the afternoon of October 9 at Beijing Zi Yu Hotel. Professor Kuang Shangfu, president of IWHR and director of IRTCES, Professor Guo Suoyan, deputy director of the Department of Water and Soil Conservation of the Ministry of Water Resources, and Mr. Hao Zhao, division director of the Department of International Cooperation, Science and Technology of the Ministry of Water Resources attended and addressed at the opening ceremony.



Group photo taking after the opening ceremony

This training workshop is an international training project funded by the Asia Regional Cooperation

Fund, which was commissioned by the Ministry of Water Resources. The aims of this workshop is to improve the scholars' overall understanding of river basin management strategies and policies for the development of water resources, broaden and master key techniques for the control of water-induced soil erosion in river basins, and learn and share advanced techniques for the management of water resources and the conservation of soil and water. It is hoped that this workshop would promote the development of water resources in river basins and the conservation of water and soil, and foster international cooperation and exchanges among the attending scholars.



Professor Kuang Shangfu (in the middle), President of IWHR and Director of IRTCES; Professor Guo Suoyan (second from the right), deputy director of the Department of Soil and Water Conservation of the Ministry of Water Resources; and Mr. Hao Zhao (second from the left), division director of the Department of International Cooperation, Science and Technology of the Ministry of Water Resources, attended the opening ceremony and each delivered an address to the workshop participants. The opening ceremony was chaired by Professor Ning Duihu (the first from the left). Ms Wang Yanwei (the first from the right) attended this ceremony as an interpreter.

During the opening ceremony, Director Kuang delivered a warm welcome to the arriving scholars on behalf of the IWHR and IRTCES, and sincerely thanked the Division of International Cooperation,

Science and Technology of the Ministry of Water, and the Division of Soil and Water Conservation for its support in organizing this training workshop. Then he briefed the participating scholars on the developments in IRTCES and the results that the center has achieved in water resource management, water and soil conservation, and international cooperation and exchanges. Finally, he expressed his hope that the scholars will improve their understanding and friendships through this workshop and strengthen cooperation and exchanges among each other in their future work. Director-General Hao Zhao of the Division of International Cooperation, Science and Technology of the Ministry of Water Resources introduced the background and purpose of this training project, noting that Asian countries are connected through mountains and rivers and are linked by the waters of these rivers. He hoped that a higher level of regional cooperation could be initiated with the relevant countries in the fields of water resource management and techniques for water and soil conservation through this training workshop. Deputy director Guo Suoyan of the Water and Soil Conservation Department of the Ministry of Water Resources briefed the participants on the basic situation of water-induced soil erosion in China and the measures implemented for its prevention and control. He emphasized that the exchange of techniques with bordering countries and the sharing of experiences is strongly appreciated amid their implementation of measures to prevent and control water-induced soil erosion. He also hoped that this training workshop will be a rousing success, so that it will act as a bridge for promoting cooperation and exchanges between China and other countries around the world in water and soil conservation.

Twenty-six international participants from 11 countries, including Cambodia, Indonesia, Iran, Laos, Malaysia, Pakistan, Philippines, Sri Lanka, Thailand, Timor-leste, and Vietnam, and six domestic students from the three IRTCES Research Base participated in the one-week training. This training workshop invited a number of well-known experts and scholars in the fields, including Professor Wang Zhongjing from Tsinghua University, Professor Zhang Guanghui from Beijing Normal University, research fellow Li Rui from the Institute of Soil and Water Conservation, Professor Zhou Shichun of the China Renewable Energy Engineering Institute, and senior engineer You Jinjun of the IWHR, to provide training courses on the development and management of river basin water resources, water and soil conservation strategies in river basins, the monitoring and evaluation of water and sediment discharge from river basins, and the development of water and soil conservation

techniques.



Lecture giving by Prof. Wang Zhongjing from Tsinghua University

IRTCS deputy director Ning Duihu, the Secretary-general of WASWAC, also gave the participants a lecture summarizing the conservation of water and soil in China. In addition, the training workshop also extended a special invitation to a technical representative of the Beijing Datum Science and Technology Development Co., Ltd. Company to present new services and applications for geological information system technologies in the field of water and soil conservation. During this period, the participants also visited the Shangxinzhuang Soil and Water Conservation Science and Technology Park and the IWHR's Yanqing Laboratory Base in Beijing.



Participants visit the IWHR's Yanqing Laboratory Base

The content of the course was rich, informative, and exhibited an international perspective; at the same time, it presented the related practices of China in appropriate detail. In the closing ceremony, Professor Ning Duihu came to issue the certificate for all participants. Through this learning opportunity, the participants obtained a deeper understanding of the research progress and practical achievements of China in the fields of water resource management and techniques for the

conservation of water and soil. Many of the participants expressed a desire to establish mechanisms for long-term exchanges of experience and carry out follow-up collaborations.



Communications among participants



Closing Ceremony



Issuing certificates during the closing ceremony

The successful organization of this training workshop has broadened the scientific horizons of the participating scholars, enriched their knowledge base on water conservation, and established a basis for international collaborations in the relevant fields. This will be beneficial to strengthening exchanges and cooperation with countries bordering China in the field of water conservation and for advancing the implementation of the “One Belt, One Road” strategy in the field of water conservation.

Brief Introduction on Lectures and Teaching Materials during this Workshop

NOTE: ALL TEACHING MATERIALS ARE AVAILABLE AT OUR WEBSITE, DOWNLOAD HERE:

<http://www.waswac.org/Conferences.asp>

The username and password are both **waswac**

1 Prof Wang Zhongjing, Water Resources Development and Management of Watershed

Prof. Zhongjing Wang graduated in 1984 and earned his PhD in 1999 in Tsinghua University after worked 15 years in industry on the field of water resources planning application research and irrigation experiment. His major are water resources planning and management, river basin governance, hydrology model, remote sensing hydrology, and hydro-environmental history. His newly research target is the Internet of Water.

In the past 30 years, Dr. Wang and his team mainly focus on problem driven researches. They were involved many important national level water resources related plan and fundamental research, such as the program of State key science & technology, national natural science foundation of China, Chinese academy of science and Chinese academy of Engineering. He was in charge of two river basin restoration plans in northwest of China. These two plans were approved by State Council with a large investment. The plans are implemented and get great successes already which are considered the flags of river basin restoration and governance in inland dry basins. His team was also involved in the demonstration of the South to North Water Diversion plan and mainly focused on the interaction between water constrains and economic development quantitatively. The coming presentation is partly from that report.

Prof. Wang has awarded two national lever and eight provincial level prizes by his contribution to science and technology researches. His is one of the leading talents of Gansu Province and was one of the youth outstanding talents of Ministry of China. He has published more than 160 papers and 6 books. He is the vice dean of School of Civil Engineering, Tsinghua University, and the deputy director of State Key Laboratory of Hydrosience and Engineering, China.

The history of China is also the history of water resources development

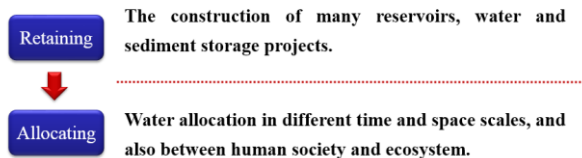
The History of Management Strategies of Yellow River in the past 5000 years

Zhongjing Wang
Professor in Hydrology and Water Resources
zj.wang@tsinghua.edu.cn
Tsinghua University

Oct 10, 2016 Beijing

A summary of strategies

➤ There are six stages developing after New China:

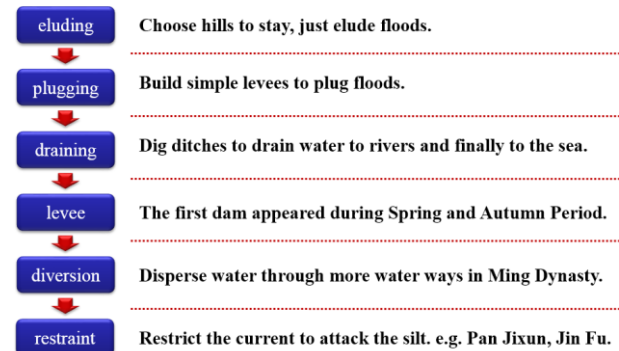


What is the next?

Outline

- 中国的气候与水资源分布
Water Resources in China
- 世界主要跨流域调水工程
Inter-basin Water Diversions in the world
- 从宏观经济水资源看南水北调
A macroeconomic view of SNWD
- 南水北调现状与关注焦点
The present and future of SNWD
- 结语
Summary

A summary of strategies



Do we need water resources development?

Why China needs South-to-North Water Diversion (SNWD)

Zhongjing Wang
Professor in Hydrology and Water Resources
zj.wang@tsinghua.edu.cn
Tsinghua University

Oct 10, 2016 Beijing

I. COLORADO RIVER PROFILE

II. COLORADO RIVER WATER RESOURCES ALLOCATION HISTORY

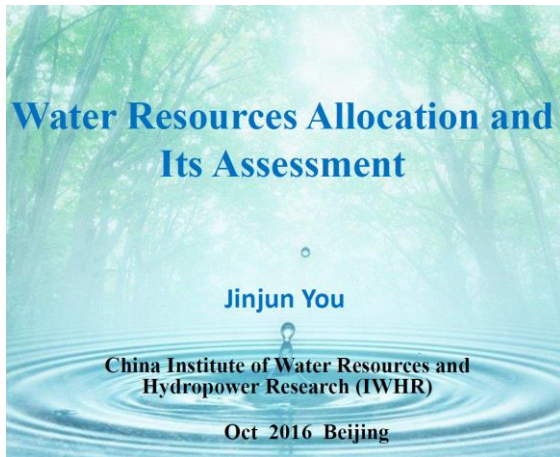
III. FEATURED STATES

IV. SIGNIFICANCE FOR US

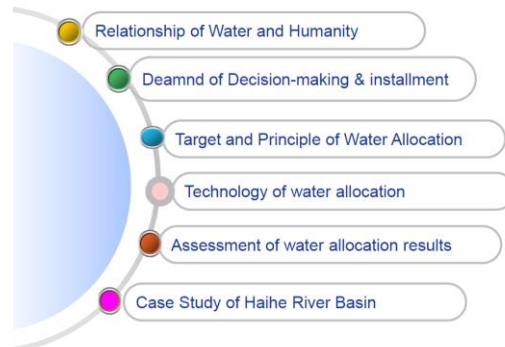
2 Dr You Jinjun, Water Resources Allocation and Assessment on Watershed

Dr. Jinjun You is a Senior Professor of Department of Water Resources Research, China Institute of Water Resources and Hydro-power Research (IWHR), Executive Committee Member of China Chapter of IAHR, and Member of IAHS. Dr. You obtained his PhD of hydrology and water resources engineering in 2005 under supervision of distinguished academician Dr Wanghao, and finished his

Post-Doctor study in Tsinghua University in 2007. Dr. You has been dedicated in research on water resources system simulation, water allocation and hydraulic projects operation, participated a series of application work related to water resources planning and management, and published dozens of papers and monographies based on the research.



outline



水资源的经济服务功能及其层次 Economic Service Functions and priority

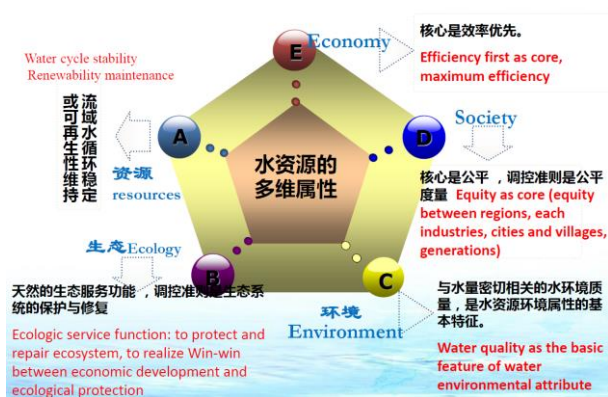


新出现的问题 New Problems

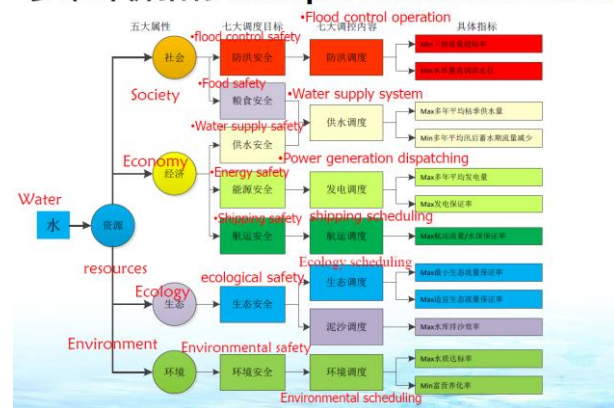
Problems?



Multi-objective evaluation objectives and Rules



多维评价指标 Multiple Evaluation Index



3 Prof Zhang Guanghui, Assessment of Runoff and Sediment Yielding on Watershed

Dr. Guanghui Zhang is a professor at School of Geography, Beijing Normal University. He teaches hydrology and researches on soil erosion, mainly focus on soil detachment by overland flow, sediment transport capacity on steep slopes, and the feedback relationship between sediment transport and soil detachment. At present, his research mainly focus on the potential effects of the changes in near soil surface characteristics driven by farmland abandonment on soil erosion processes in the Loess Plateau of China. He is the editorial board of International Soil and Water Conservation Research, Chinese Society of Soil and Water Conservation, and Bulletin of Soil and Water Conservation. Dr. Zhang has published 135 papers and 46 of them were cited by SCI system. His paper has been cited more than 2500 times.

Soil erosion process, measurement, and prediction

Guang-hui Zhang

ghzhang@bnu.edu.cn

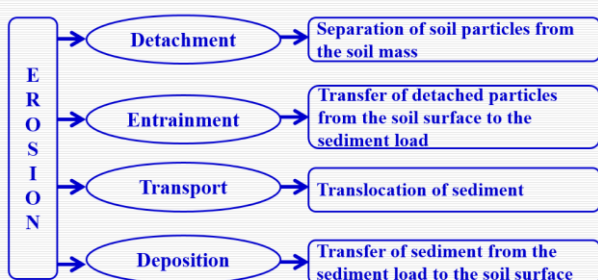
Beijing Normal University

2016.10

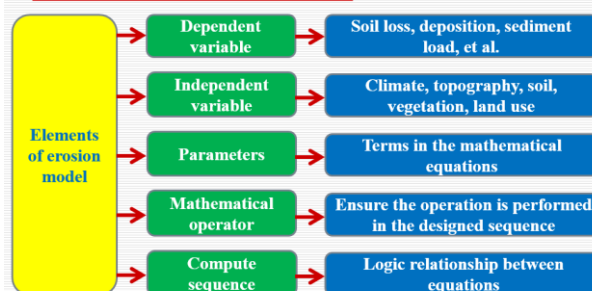
Content

- Soil erosion
- Factors influencing soil erosion
- Erosion type
- Erosion process
- Erosion measurement
- Erosion prediction

Erosion processes



Erosion prediction



Regression-derived

Index-based (empirically based /lumped process model)

Simple process-based

Model type

Combined index and processes-based

Dynamic between storms

Dynamic within and between storms

4 Prof Li Rui, Overview of Soil and Water Conservation

Prof. Rui Li is a research professor of Institute of Soil and Water conservation, CAS\MWR and NWUAF. He is the president of World Association of Soil and Water Conservation (WASWAC), taking the position of Chief Editor of International Soil and Water Conservation Research.

His main research fields include regional soil/water conservation and environment, land resources evaluation, land-use planning, monitoring of soil and water loss using remote sensing and GIS technologies.

He graduated from Department of Biology, Lanzhou University in 1970, further study in Geography Department of Northwest University 1983-1984, advanced study and work in CSIRO, Australia 1984-1986. Since 1972, he has been involved in research on SWC in the Institute of Soil and Water Conservation (ISWC) CAS/MWR and finished more than 30 projects as the leader or member. 1994-2001 was the deputy director and 2002-2006 as the director of ISWC.

Since 1972 he has been involved in research on soil and water conservation planning, land resources investigation and monitoring of soil erosion using remote sensing, and made research achievements and contribution to regional soil and water conservation, application of remote sensing and GIS. Main fields include: (1) Planning and evaluation of comprehensive control of soil erosion at small watershed scale; (2) Digital remote sensed image processing and extraction of soil erosion factors; (3) Theory and methods of regional investigation of soil and water loss; (4) Evaluation of regional impacts of soil and water loss/conservation on environment. There are 12 projects had been awarded by the provincial and national governments.

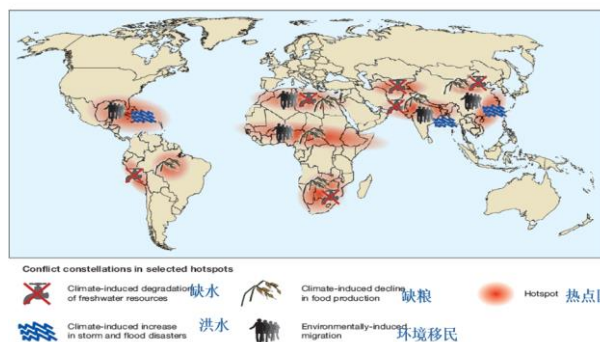
He has more than 120 papers published on the journals and international conferences and 12 books published as the chief editor or co-editor.

Overview of Global Soil and Water Conservation



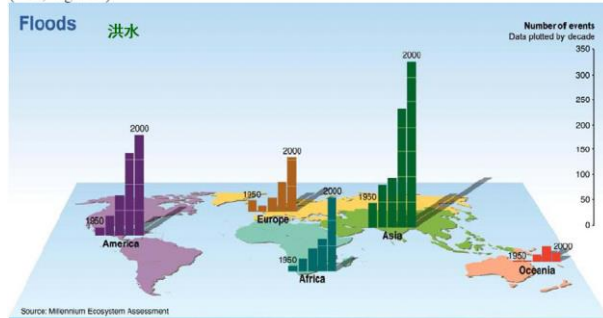
Some Areas Suffering Climate changing

Source: German Scientific Committee on Global Environment Issues, 2007

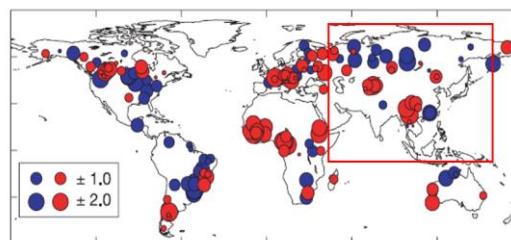


Flood Events in the World

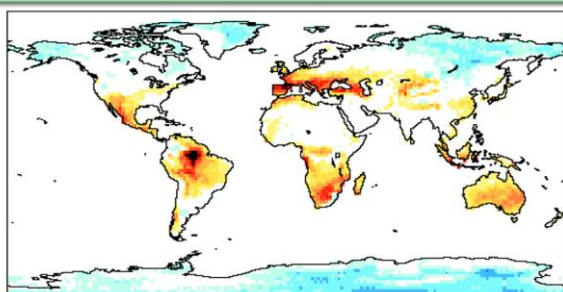
Appendix Figure A.7. Number of Flood Events by Continent and Decade Since 1950 (C16, Fig 16.6)



Current runoff changes over the world

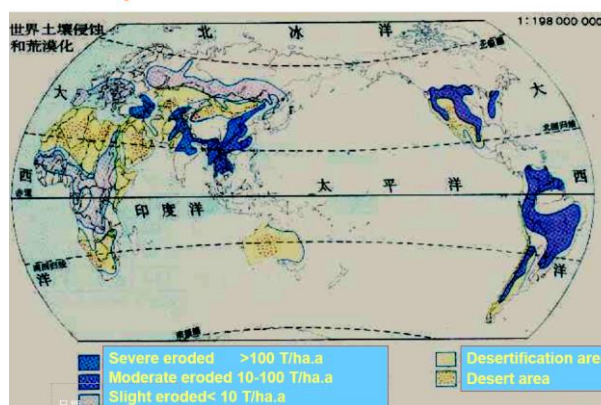


Trend of Drought in the world



Percentage change in average duration of longest dry period, 30-year average for 2071-2100 compared to that for 1961-1990.

The Map of Soil Erosion and Desertification



Global Current Soil Erosion Area (10⁴ km²)

type	Class	L	M	H	VH	Total
Water Erosion		343.0	526.8	217.2	6.6	1093.6
Wind Erosion		268.6	253.5	24.3	1.9	548.3
Total		611.6	780.3	241.5	8.5	1641.9

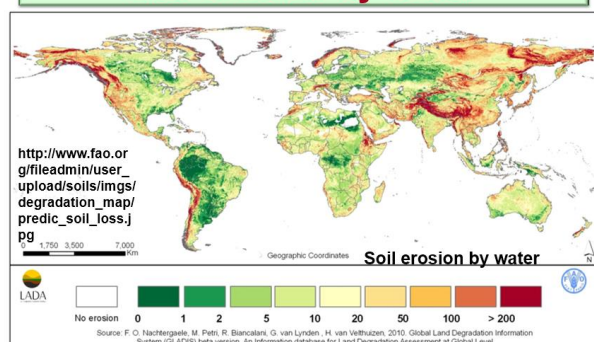
Global Current Soil Erosion

	Light	Moderate	Strong + Extreme	Total	Percentage of degraded soils	Dryland zone ¹	Humid zone ¹
Africa	58	67	102	227	46 %	122	105
Asia	124	242	73	441	59 %	165	276
S. America	46	65	12	123	51 %	35	88
C. America	1	22	23	46	74 %		
N. America	14	46	-	60	63 %	38	68 ²
Europe	21	81	12	114	52 %	48	66
Oceania	79	3	+	83	81 %	70	13
WORLD	343	526	223	1094	56 %	478	615

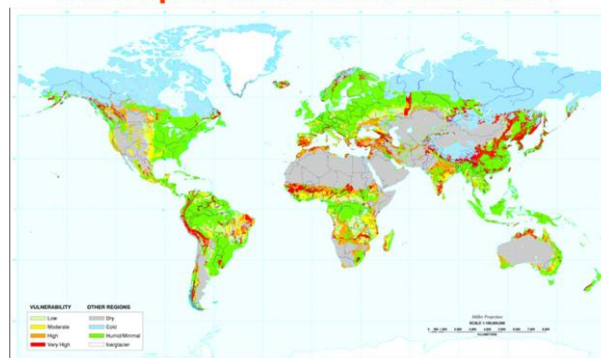
¹ Dryland zone is defined as the climatic region with an annual precipitation/evapotranspiration ratio of 0.65 or less (UNEP, 1992a).
² The humid zone has a ratio of more than 0.65.

² North + Central America

Soil erosion by water



The Map of Wind Erosion in world



5 Prof Zhou Shichun, Hydropower Development and Planning

Water: Source for Sustainable Development in the Lancang-Mekong Basin

October 14, 2016
Beijing, China

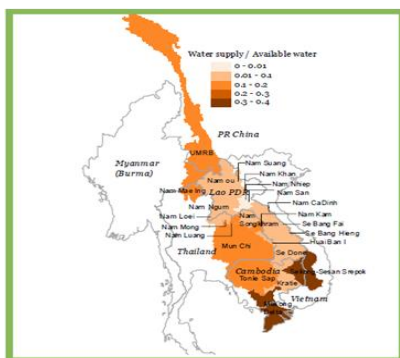
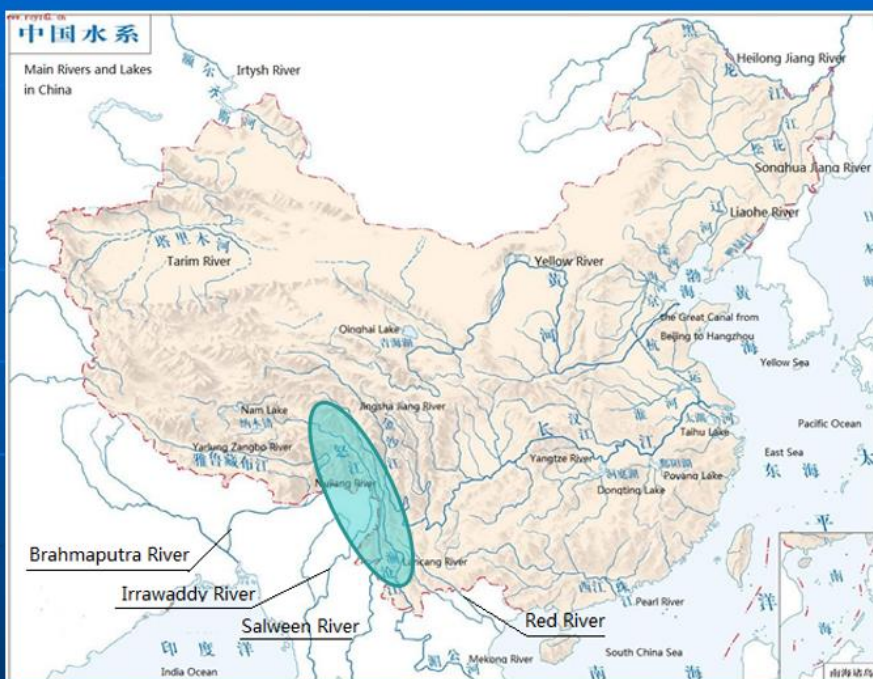
Presenter: Zhou Shichun
Deputy Secretariat General, ESCIR, China
Email: zhoushichun@vip.sina.com

Outlines

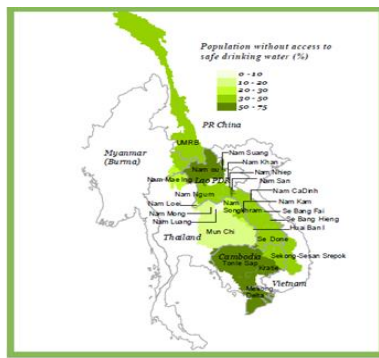
1. Understanding Water Resources in the Lancang-Mekong River
2. Challenges in MRB regarding to Water Resources
3. Updates of Hydropower development in the Lancang River
4. Environment Protection Measures Taken in the Lancang River
5. Cooperation and Exchanges between the upstream and the downstream

Main Rivers and Lakes in China

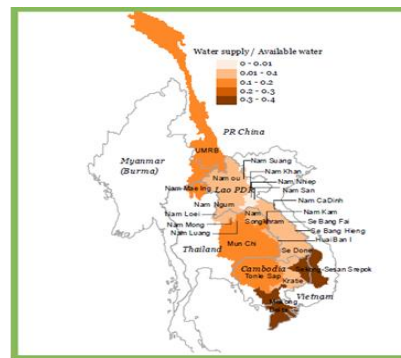
- Basins to Pacific Ocean:
 - Heilongjiang River
 - Haihe River
 - Yellow River
 - Huaihe River
 - Yangtze River
 - Pearl River
 - Lancang River
- Basins to India Ocean
 - Nujiang River
 - Yarlung Zangbo River
- Basins to Arctic Ocean
 - Irtysh River
- Interior Basins
 - Ili River
 - Tarim River



Annual water exploitation in the Mekong River sub-basins

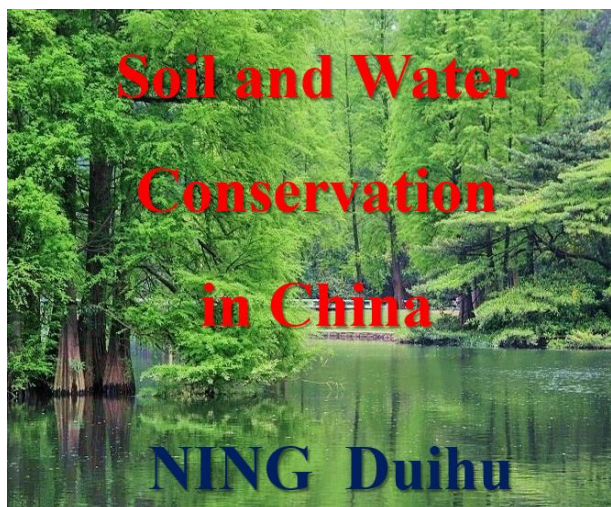


Population without access to safe drinking water in the Mekong River sub-basins



Annual water exploitation in the Mekong River sub-basins

6 Prof Ning Duihu, Brief Introduction on Soil and Water Conservation in China



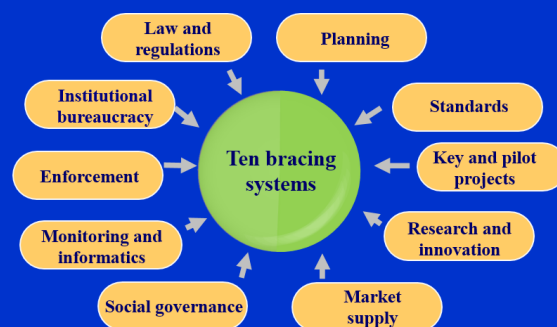
CONTENTS

1. Soil erosion situation
2. Main measures and achievements
3. Major Challenges
4. National Plan and Strategies

National soil and water conservation zoning



Fundamental and bracing system has been established



The objectives of National Plan

Before 2030

- In-depth and fully covered prevention and protection will be established
- Vegetation and coverage will be fully protected and rehabilitated
- Benign cycle of eco-environment become stable
- Soil and water loss in the key areas will be comprehensive management
- 940 thousand km² area will be carried on comprehensive watershed harness measures (among that 320 thousand km² area will be harness before 2020)
- Human-induced erosion shall be strictly supervised and controlled
- The capability of erosion reduction will increase 1.5 billion tons

Strategic measures



Brief Introduction on Organizers



International Research and Training Centre on Erosion and Sedimentation

The International Research and Training Center on Erosion and Sedimentation (IRTCES) was jointly set up by the Government of China and UNESCO on July 21, 1984, in Beijing, China. The Ministry of Water Resources is the governmental executive agency.

Since its founding, IRTCES has devoted itself to research and training to solve scientific and engineering problems related to erosion and sedimentation, and is one of the most important representatives of China as a partner of UNESCO. IRTCES has conducted many international and domestic technical cooperative research and consulting programs and projects related to erosion and sedimentation, and organized international and domestic training courses, symposia, and workshops. It publishes the International Journal of Sediment Research, International Soil and Water Conservation Research, the Gazette of River Sediment in China, and other publications.

IRTCES awards the Chien Ning Prize for outstanding sediment researchers and engineers. It is the organizer and promoter of the National Information Network of Erosion and Sedimentation and the Sediment Measurement and Research Team. IRTCES Serves as the Secretariat of the World Association for Sedimentation and Erosion Research (WASER) and the Secretariat of the World Association of Soil and Water Conservation (WASWAC).

IRTCES welcomes future cooperation and collaboration with sister organizations, including government bodies, research institutes, universities and consultants in sediment-related fields all over the world to promote international development on erosion and sedimentation, sustainable utilization of natural resources and melioration of the ecological environment.

Website: www.irtces.org



China Institute of Water Resources and Hydropower Research

China Institute of Water Resources and Hydropower Research (IWHR) is a national research institution under the Ministry of Water Resources of China, and is engaged in almost all the disciplines related to water resources and hydropower research.

The institute has established extensive exchanges and cooperation with nearly one hundred foreign research institutions, prestigious universities, academic communities and international organizations. IWHR is engaged in consulting services for many overseas projects, undertaking research, planning, design, construction and management tasks. IWHR has carried out a wide range of professional services including technical consultancy, construction supervision, project monitoring and safety evaluation.

Over the years, IWHR has completed many research and consultancy tasks for hundreds of key projects. The scope of these tasks covers a wide extent, water resources management for nationwide and large river basins, water environment protection, flood control and drought relief, river regulation and inter-basin water transfer, sedimentation in rivers and reservoirs, structural optimization, earthquake resistant analysis, complex foundations treatment, hydro-electric equipment testing and checking, power plant automation, safety monitoring, construction materials design and control, new technology for concrete faced rock-fill dam and roller compacted concrete dams, hydro-turbine sets and rehabilitations, cooling water study, fly ash deposit, etc.

IWHR will observe the scientific concept of development, the philosophy of "harmonious co-existence between human and nature" to provide scientific and technological support and assurance to the sustainable development of water resources.

Website: www.iwhr.com



The World Association of Soil and Water Conservation

The World Association of Soil and Water Conservation (WASWAC), as a worldwide academic society, was established in August 1983. The vision of WASWAC is “A world in which all soil and water resources are used in a productive, sustainable and ecologically sound manner”. The mission of WASWAC is “To promote worldwide the application of wise soil and water management practices that will improve and safeguard the quality of land and water resources so that they continue to meet the needs of agriculture, society and nature.”

WASWAC is in charge of the Norman Hudson Memorial Award, Distinguished Research Award, Distinguished Extensionist Award, Special Contribution Award, and Outstanding Youth Paper Award to evaluated excellent soil erosion and conservation researchers.

WASWAC organizes a world conference every 3 years. The former three sessions were held in China, Thailand and Serbia, respectively, the coming fourth session will be held in India in 2019.

WASWAC has published a series of books and issues the monthly Hot News. Since 2013, WASWAC started to publish peer reviewed English academic quarterly journal of “International Soil and Water Conservation Research” (ISWCR). All papers of ISWCR are available at ELSEVIER website, welcome to submit your fresh fruits to this journal, all published papers are free to download at:

<http://www.journals.elsevier.com/international-soil-and-water-conservation-research>

WASWAC now has 1,225 members from 82 countries, classified in 5 categories: Individual members (IM), Life members (LM), Organization members (OM), Student and Gift members (SM & GM) and Guest members (GM). Welcome to be a member of WASWAC! Join us online!

Website: www.waswac.org

Thank You, Volunteers

Volunteers from Beijing Normal University, Beijing Forestry University and China Agricultural University provided very helpful and useful service during the whole process, including training, field trip, picking-up, and sending participants to airport, etc. The organizers express much appreciation for all of them.



These young people who have helped the workshop over the holding period in so many ways. That we have so many who are keen to be involved and support the workshop is an impressive indication of the spirit of our association. We are so grateful to all who help to make the workshop successful. Thank you, volunteers!