

程国栋 雷志栋 拉·本格森 主编

Cheng Guodong Lei Zhidong Lars Bengtsson

干旱内陆河区水资源可持续利用和植被－水文－沙漠的相互作用
国际学术研讨会论文集

Proceedings of the International Symposium on
Sustainable
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Management and
Oasis-hydrosphere-desert
Interaction in Arid Regions



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内 容 简 介

水资源可持续利用与经济社会协调发展是人类面临的共同问题。2005年,“干旱内陆河区水资源可持续利用和植被-水文-沙漠的相互作用”国际学术研讨会在清华大学召开,本书精选了会议的30余篇论文,以干旱区水资源可持续利用为核心,讨论了干旱区植被-水文-沙漠的相互作用机理、水循环系统模型及其构建方法、中国西北内陆河区水资源开发利用影响评价、干旱区水文及生态环境变化、水资源规划与管理、数字流域建设和现代节水技术及节水型社会建设等内容。这不仅对于西北地区的水资源可持续利用具有重要的促进作用,而且对中国其他地区水资源的研究乃至世界类似地区的水资源合理利用、科学管理和有效保护都有十分积极的意义。

本书可供水利、地理、资源管理等专业的科研人员、管理人员和相关院校的师生阅读参考。

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Preface

This volume contains most of the papers presented at the international symposium on *sustainable water resources management and oasis-hydrosphere-desert interaction in arid regions* held at Beijing, China, in October 27-29, 2005. The symposium was jointly hosted by Tsinghua University (Department of Hydraulics) and Cold and Arid Regions Environmental and Engineering Research Institute, Chinese Academy of Sciences.

The arid and semi-arid regions account for approximately 30% of the world total area and are inhabited by approximately 20% of the total world population. The arid regions of northwest China include all of the Xinjiang Autonomous Region, Hexi Corridor in Gansu Province and the area west of Helan Mountain in Inner Mongolia, where ecological environment is extremely fragile. The overgrowing population and the recent development of water and land resources are putting water resources under pressure and calling for new approaches for water planning and management if escalating conflicts are to be avoided and environmental degradation is to be reversed. Moreover, the efficient use of water becomes increasingly important because water is a crucial limited factor for economic and social development. Also issues of present and future climate variability and change on agriculture and forestry in arid regions have to be addressed.

These published papers describe the latest researches in water resources of arid regions. The involved symposium themes are divided into four topics below:

1. Oasis-hydrosphere-desert Interaction

- *Trend of desert expansion and its interaction with Oasis, vegetation and hydrosphere*
- *Numeric model software demonstration*
- *Master plan and suggestions for future development*
- *Summary of Project achievements*

2. Water Cycle Systems Modeling

- *Catchment hydrology modeling*
- *Macro-economy water resource modeling*

- *Surface water groundwater interaction*
 - *Land surface process*
 - *Ecological modeling*
 - *Scale and uncertainty in modeling*
3. Development of Water Resources in the China North-West Inland Rivers and Impact Assessment
- *Characteristics of water cycle in arid environment*
 - *Review of water resources development*
 - *Environmental impact of water project*
 - *Assessment of accumulated impact of water resources development*
4. Development of Water-Saving Technologies and Society
- *Water-saving technologies*
 - *Water use efficiency*
 - *Water pollution control*
 - *Conceptual structure of water-saving society*

Special thanks must go to the support of the National Natural Science Foundation of China and the project of *Oasis-hydrosphere-desert Interaction Influencing Overall Economical Development* (Asia Pro Eco 2598/06-2003/62860), and also the painstaking work of secretary group. We are particularly grateful to the firm support of each faculty and college of higher education.

We hope that, through this symposium, we can impluse academic communication and showcase the latest researches in water resources of arid regions, and carry out the strategy studies of the Ministry of Water Resources for developing water saving society, so as to promote the harmonious coexistence of human beings and nature finally in arid regions.

Cheng Guodong
Dean of Chinese Academy of Sciences, Lanzhou
Chair of Organizing Committee

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