

Preface

Reservoirs reduce peoples' dependence on the natural availability of water in rivers and streams. In this role they have been important tools for the development of civilization. They have been built throughout human history, a process accelerated and augmented by modern technology in the 20th century. In many parts of the world more reservoirs are still needed to provide a higher quality of life for the population, which may possibly double in less than a century. In recent years, it has become a common perception that reservoirs must serve for the protection of both human beings and the environment during the life time of this generation as well as of future generations. How do we construct and manage reservoirs to meet these requirements? This is the crucial question of sustainable reservoir development and management.

Much has been said about the concept of sustainable development, a UN-supported principle since its formulation in 1987 by the World Commission on Environment and Development (WCED). Although it has been widely accepted as a basic principle, concrete workable criteria by which the principle can be applied in practice are as yet unidentified. This is the problem we face in almost all plans for the construction of new dams and the management of existing reservoirs, and our societies are still waiting for a rational and scientifically-based answer. The International Commission on Water Resources Systems (ICWRS) of the International Association of Hydrological Sciences (IAHS) considered it a duty to review the problem, scientifically and practically, and provide guidelines for sustainable development and management of reservoirs.

In July 1993 during the 4th Scientific Assembly of IAHS in Yokohama, Japan, the ICWRS Bureau decided to look jointly into this important issue as a Commission Project under the title "Sustainable Reservoir Development and Management". A project team was formed consisting of, respectively, the ICWRS Bureau officers: Lev S. Kuchment, Russian Academy of Sciences, Moscow, Russia; Zbigniew W. Kundzewicz, Polish Academy of Sciences, Poznan, Poland (then at WMO, Geneva, Switzerland); Dan Rosbjerg, Technical University of Denmark, Lyngby, Denmark; Slobodan P. Simonovic, University of Manitoba, Winnipeg, Canada and Kuniyoshi Takeuchi, Yamanashi University, Kofu, Japan; the Chairperson of the Water Resource Management Section (1993-1997) of the International Association for Hydraulic Research: Peder Hjorth, Lund University, Sweden; and three Japanese scholars in the field of water resource systems management: Shuichi Ikebuchi, Kyoto University; Toshiharu Kojiri, Kyoto University (then Gifu University); and Norio Okada, Kyoto University. In addition, the following three experts agreed to contribute a case study each: Nils Roar Saelthun, Norwegian Institute for Water Research, Oslo, Norway;

Hussam Fahmy, National Research Institute, El-Qanatir, Egypt and; E. D. Andrews, US Geological Survey, Boulder, Colorado, USA. Research grants were sought, and the project team is most grateful to the River Environment Fund of Japan, for awarding JPY 1 700 000, which made it possible for the project team to meet in Kyoto in 1996.

A Mini-Workshop on the project held in Boulder, Colorado, on 9 July 1995 during the XXI General Assembly of the International Union of Geodesy and Geophysics, signified the real start of the project: specifying the programme and the role of each member. Based upon those discussions and subsequent correspondence, a draft report was compiled in August 1996 and discussed at the International Workshop on Sustainable Reservoir Development and Management in Kyoto on 1 November 1996. This event was attended by about 20 specialists and organized during the International Conference on Water Resources and Environment Research. Further work was suggested, and another round of discussions took place. A draft final report was compiled in March 1997 and discussed in Rabat, 28–30 April 1997, during the 5th Scientific Assembly of IAHS. At this stage, Professor Michael Hamlin, a former President of ICWRS, joined the team and agreed to act as an additional editor for the complete volume. As a result of the discussions in Rabat, some major revisions were agreed in order to make the document comprehensible to a wider audience. Another three rounds of improvements and editorial review took place before it was finally submitted for publication in July 1998.

It took five years to complete the project since the first discussions, or three years from the start of the real work—much more than expected! We believe, besides the busy schedules of the team members, that this is a manifestation of both the topic complexity and the difficult process of reaching consensus between different views on the possible approaches towards sustainability of reservoir management.

The project team is indebted to many individuals and institutions. First of all, the team would like to express its deep gratitude to the individual contributors to the report. All the authors and co-authors are listed in the table of contents. Without their contributions, this project could not have been completed. Also, we thank the many individuals who provided valuable comments and suggestions. Last but not least, we appreciate the continuous encouragement of the IAHS Bureau, including the financial support of US\$5000 from the IAHS 1996 Interdisciplinary Research Fund. With all this support the project became feasible.

The project team wishes this report to serve for the improvement of current practice and for stimulation of further research on sustainable reservoir development and management.

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