
Preface

The Three Gorges Project (TGP) is a mega-water control project that has attracted worldwide attention. It is a key project in harnessing the Yangtze River, bringing about benefits in flood prevention and control, power generation and navigation. However, the project will partially change the hydrological regime of the Yangtze that will induce changes in and exert impacts of different degrees on ecology and environment and even on the whole social and economic development in the middle and lower reaches of the river. Prior to the start of the project, China had organized national research institutions to carry out a demonstration work and compile the “TGP Environmental Impact Statement (EIS)” from different perspectives, including natural environment, social environment, public concerns and the impacts on ecology and environment, on the basis of a huge amount of investigations, studies, and scientific experiments.

In accordance with EIS requirements and official directions, the Executive Office of SCTGPCC organized in 1996 the preparation of an Action Program to establish a TGP ecological and environmental monitoring system, covering such areas as water power, environmental protection, agriculture, forestry, meteorology, health, geology and mineral resources, earthquake, and communications, with a joint effort by a number of departments and units, including CAS, the China Three Gorges Corporation (CTGC), and related departments of Hubei Province and Chongqing Municipality. The system is designed to track down and monitor the ecological and environmental impacts that might be caused by the construction and operation of the dam, and to issue timely warnings so as to provide scientific basis for the management and for the central leadership to take policy decisions and to accumulate a complete data for a retrospective assessment of the TGP environmental impacts.

The monitoring system covers mainly the Three Gorges reservoirs area, with its extension reaching the middle and lower reaches of the river, the estuary, and other related areas. It mainly undertakes to monitor the changes and development trends of all ecological and environmental factors to be affected by TGP, explores laws governing the changes before and after the dam is erected and maintains a good dynamics of the ecosystem in the project affected areas. Apart from the monitoring objectives, the system will also provide countermeasures to mitigate adverse effects and carry out experiments and demonstrations to drive for a harmonious development of economy and environment. In regard to issues which have no thorough understanding, more active efforts will be exerted in experiments and applicable researches for a systematic solution to construct the ecology and specific countermeasures to optimize the solution.

A fair TGPEEMS has taken a complete shape through 10 years of hard work, including several major adjustments and supplements in view of making it standardized, scientifically and systematically. The system has 12 sub-systems, including 15 key monitoring stations, 4 for experiments and some dedicated to special purposes, covering disciplines such as hydrology, water quality, atmosphere, terrestrial animals and plants, aquatic life, agricultural ecology, eco-agricultural experiments, social and economic development, pollution sources, and public health. Thanks to the Executive Office of the SCTGPCC, who played a key role in mobilization and coordination, specialized monitoring networks have been set up, such as the

one in the dam-site area, and those for possible induced-earthquake and geological disasters in the reservoir area as well as the sediment stations in the reservoir and downstream one after another on the stem of the river. Together, they have formed the TGPEEMS. By June 2003, when the reservoir began to store water, the system had already accumulated a lot of baseline data and materials about the ecological and environment.

The TGPEEMS has gone through a process of planning–adjustment–recompilation, which is also a cycling of theory–practice–improvement. This system is China’s only trans-regional, trans-sector comprehensive monitoring and research-oriented network involving multiple disciplines. It is an essential part of the ecological and environmental protection program of TGP. It is also an engineering network essentially different from those operated by relevant governmental agencies. For the sake of saving costs, the system relies mainly on the existing monitoring contingents of different departments and units and places it in the service of the TGP.

The TGPEEMS had nothing to go by in its making-up, only with the approved TGP EIS as its basement, while there were new situations and new problems cropping up in the course of construction. Financial constraints and the segmentation control of Yangtze River by different departments imposed great challenges to us both in the building and operating of the program, so that it experienced coordination technically and administratively.

The book is a tentative account of the planning and operation of the TGPEEMS, over which I presided, not only as a participant. I hope that it would be of some reference and guidance in the ecology and environment monitoring particularly after the reservoir is impounded. I came to work with the Technology and International Cooperation Department, Executive Office of the SCTGPCC in September 1993. As a leading member responsible for technology, I was fortunate enough to personally experience the compilation, building, and improvement of the monitoring system, which is a crystallization of hard work and sweat of scientists, technicians and people of central government departments. Without the wise leadership and the support of the older generation of scientists, it would have been impossible to complete this monitoring system, make it work efficiently and fulfill all the anticipated monitoring tasks.

The book has nine chapters. Chapter 1 is an introduction to TGP, including the dam project, people resettlement, and power transmission, together with an overview of the pre-TGP ecological and environmental situation of the reservoir area and the Yangtze River basin as a whole. Chapter 2 is devoted to the environmental impact assessment (EIA) of the TGP, which contains basic and background information about the TGP ecological and environmental monitoring system, including its arrangement and targets. Chapter 3 is a briefing of the environmental protection and monitoring practice of big dams at home and abroad, such as the Aswan High Dam, the Itaipu Dam of Brazil, the Glen Canyon Dam of the United States, and the Ertan Dam of China, with a hope to draw on alien experiences. Chapter 4 gives a general picture of the TGP monitoring system, depicting the course of events, general structure, and the characteristics. Despite the difficulties and complicatedness, we have tried to present a framework of the general structure and an indicator system from the perspectives of theory, management, and operation. Chapter 5 is devoted to a detailed description of each major monitoring station in the sequence of sub-systems, chosen according to the conclusions reached in the EIA and the characteristics of the environmental impact of the hydropower project. Chapter 6 is about the plan for building the system, which is essential for its management. There have been two scenarios for building the information system: one is decentralized management (management by different key stations) and centralized management (management by the information management center). We have chosen the centralized management scenario for fear of data being lost and for the purpose of leaving comprehensive and complete monitoring data to future generations. Chapter 7 is devoted to the achievements at different key stations, which are only the tentative summation of the technical reports of various key stations, without an integrated analysis of the monitoring system as a whole. Chapter 8 gets deeper into problems about key stations and targets of monitoring as dictated

by the new situations and new problems after water is stored. Chapter 9 introduces a series of measures and progress with regard to environmental protection since the start of the TGP.

Presented in the book are also a large amount of color photos taken and carefully chosen by the authors for the purpose of presenting additional visual information.

Our gratitude should go to Mr. Zhang Dazhi for his careful review of English.

The TGP ecological and environmental problems are very complicated, involving many disciplines of study, which all have their own terms, standards, styles, and habits of writing. Due to limitations of knowledge on the part of the authors, some terms and way of expression may not be professional or accurate. What we can do is to base our analysis and judgment on solid grounds and evidence. Errors may exist and it behooves us to invite in real earnest bona fide criticisms and comments from the readers.

Beijing, China
April 2017

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Three Gorges Dam

Environmental Monitoring Network and Practice

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2018, XXIII, 336 p. 234 illus., Hardcover

ISBN: 978-3-662-55300-8