Preface

Wastewater treatment is a core technology for water resources protection and reuse, as is clearly demonstrated by the great success of its consequent implementation in many countries worldwide. During the last decennia scientific research has made vast progress in understanding the complex and interdisciplinary aspects of the biological, biochemical, chemical and mechanical processes involved. It can be concluded that the global application of existing knowledge and experience in wastewater treatment technology will represent a cornerstone in future water management, as expressed in the Strategic Development Goals accepted by the UN in September 2015.

Only about one fifth of the wastewater produced globally is currently being adequately treated. To achieve the goal for sustainable water management by 2030 would require extra wastewater treatment facilities for about 600,000 people each day. I am convinced that this book will make its own significant contribution to meeting this ambitious goal.

In the near future, most of the global population will live in cities and in low and middle-income countries, where most wastewater is not adequately treated. Probably the most limiting factor in achieving the goals for sustainable water management is the lack of qualified, well-trained professionals, able to comprehend the scientific research results and transfer them into practice. It is therefore of prime importance to make currently available scientific advances and proven experiences in wastewater treatment technology applications easily accessible worldwide. This was one of the drivers for the development of this book, which represents an innovative contribution to help overcome such a capacity development challenge. The book is most definitely expected to contribute to bridging the gaps between the science and technology, and their practical applications.

The great collection of authors and reviewers represents an interdisciplinary team of globally acknowledged experts. The book will therefore make a major contribution to establishing a common professional language, enhancing global communication between wastewater professionals. In addition, the authors have linked the description of the scientific basis for wastewater treatment processes with a video-based online course for the training of students, researchers, engineers, laboratory technicians and treatment plant operators, demonstrating commonly accepted experimentation procedures and their application for lab-, pilot-, and full-scale treatment plant operation.

From the perspective of the IWA this book also has the great potential to enhance the development of a new generation of researchers and enable them to communicate on a global scale and beyond their specific field of expertise. Both aspects are urgently needed to develop adapted solutions for specific local conditions and to make them globally available for implementation.

There has been a trend for some time that scientific research and practice have been growing apart from each other. Part of the reason for this is the global implementation of an academic assessment method that primarily focuses on the impact of publications on the progress in scientific research. Applied research results with an impact on practice in water quality management are not yet being sufficiently rewarded as their impact is not always reflected by citations in scientific journals. This book attempts to overcome this problem as it aims to enhance the dialogue and co-operation between scientists and practitioners. Scientists are encouraged to deal with the practical problems with scientific methods, while the practitioners are encouraged to understand the scientific background of all the processes relevant for treatment plant optimization.

While conventional wastewater treatment plant operation was driven by effluent quality and cost minimization, this book fully incorporates the paradigm shift towards material and energy recovery from wastewater. In this respect the book is also very relevant for developed countries, as the new paradigm will heavily influence the future development of wastewater management worldwide.

As IWA president I want to congratulate the authors of this book on their great achievement and also thank the Bill & Melinda Gates Foundation and the Dutch government for their financial support.

Prof. Dr. Helmut Kroiss
President International Water Association