

# Wetlands: Ecology, Conservation and Management

Volume 7

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The recognition that wetlands provide many values for people and are important foci for conservation worldwide has led to an increasing amount of research and management activity. This has resulted in an increased demand for high quality publications that outline both the value of wetlands and the many management steps necessary to ensure that they are maintained and even restored. Recent research and management activities in support of conservation and sustainable development provide a strong basis for the book series. The series presents current analyses of the many problems afflicting wetlands as well as assessments of their conservation status. Current research is described by leading academics and scientists from the biological and social sciences. Leading practitioners and managers provide analyses based on their vast experience.

The series provides an avenue for describing and explaining the functioning and processes that support the many wonderful and valuable wetland habitats, such as swamps, lagoons and marshes, and their species, such as waterbirds, plants and fish, as well as the most recent research directions. Proposals cover current research, conservation and management issues from around the world and provide the reader with new and relevant perspectives on wetland issues.

Alexandros Stefanakis  
Editor

# Constructed Wetlands for Wastewater Treatment in Hot and Arid Climates

 Springer

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# Preface

The idea for this book, and generally on the use and the potential of constructed wetlands in hot and arid climates, was born several years ago while working on wetland projects in countries with these climatic conditions. On the one hand, countries with this climate suffer from high to extreme water scarcity and limited freshwater resources, while the water demand is always increasing. On the other hand, wastewater in most of these countries is still viewed as a waste rather than as a valuable resource. Many factors contribute to this based on my experience, including financial and technical barriers as well as social and cultural aspects. But even if some of these barriers are lifted, circular management of treated effluents, for example, for reuse in irrigation, is typically not a priority. However, sustainable wastewater management is rapidly seen as an opportunity, and a shift is taking place slowly but steadily. Under these extreme climates, treated wastewater can be a significant new water source in the local and regional water balance. And this is where nature-based solutions such as constructed wetlands can play a critical role.

The technology of constructed wetlands is not new. While there are numerous applications in Central and Western Europe, North America, and Australia, it is much less frequently applied in regions with hot and arid climates (e.g., Middle East, Central and North Africa). We now know that this technology can be an ideal sustainable solution for wastewater management in these regions. From a technical point of view, the warmer climate and the higher temperatures favor many pollutant removal processes and further reduce the areal footprint. This technology also fits well the population patterns in these countries with many small, remote settlements where decentralized solutions are needed, as well as the economic and social characteristics that require cost-effective and easy-to-build and operate facilities.

The book you are holding is the first attempt to gather most of the available information and experience on constructed wetlands in hot and arid climates. The published literature on this topic is not extended and quite fragmented among journal papers and technical reports, considering also that this sustainable technology has not yet penetrated in deep the relevant markets. Therefore, the idea was to collect as many as possible of the existing case studies, research projects, and demonstration facilities that have been implemented in countries with this climate. The result

proved to be more than satisfying. The book has 21 chapters with constructed wetlands examples and studies from 29 different countries, making it the first single reference in the international literature on this topic.

It is my hope that this book will successfully demonstrate to all relevant stakeholders the potential and benefits of this sustainable technology for the local/regional/national water sectors and contribute to the wider adoption and implementation of constructed wetlands for sustainable and circular wastewater management in these climatic regions.

Chania, Greece  
10 April 2022

Alexandros Stefanakis

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