Preface

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In our time, debates and proposals surrounding water research and water resources have attained an unprecedented importance. There has been increasing generation and propagation of ideas and knowledge, as well as of projects aimed at solving current worldwide water challenges; our country has not been the exception. In Mexico, various institutional programs have flourished, centred on aspects such as: the development of water use and reuse capabilities; systematizing public knowledge regarding water management; subsistence and recovering ecosystems closely tied to water uses and administration.

The National Autonomous University of Mexico, for example, has promoted the UNAM Water Network (RAUNAM) among its recent projects. This specialized network emerged in the context of the IV World Water Forum that took place at the beginning of 2006 in Mexico as a response to the complex problematic exposed in the Forum by the academic community. Today, RAUNAM constitutes an active and effective partnership platform enabling members of the university to keep up to date regarding research, taught courses, and other water-related activities.

Equally valuable has been the constitution and consolidation of the Scientific Network on Water (RETAC) by the National Council on Science and Technology (CONACYT). RETAC is part of CONACYT's efforts to integrate the sum of contributions by institutions, researchers, and academics, as well as by civil organisations and businesses. It was created in January 2009 following a multi-institutional meeting in order to face the scientific, political, social, cultural, and business challenges of water in Mexico, and to contribute to a sustainable management and equitable and responsible administration of this indispensable natural resource. Fundamentally, RETAC is oriented towards: a) understanding the complexity of water-related problems; b) developing new technologies and research methods; c) homogenizing scientific research methods for comparative purposes; d) reflecting about hydrological policies in order to protect Mexico from the impact of climate change; and e) disseminating findings.

Resulting from the discussions of the first RETAC's international congress in 2009, the collective work *Water Resources in Mexico. Scarcity – Degradation – Stress – Conflicts – Management and Policy* is here presented. Its multidisciplinary and multi-institutional character is one of its most distinctive features, successfully gathering the reflections, doubts, analyses, and viewpoints of scientists, specialists, public servants, and entrepreneurs from different disciplines and sectors. In addition, the fact that each chapter has been blindly peer-reviewed gives the book academic and institutional integrity.

The book is divided into five sections. Following the rich and detailed introduction by Úrsula Oswald Spring and Ignacio Sánchez Cohen, part I "Hydrological processes and management of basins" examines systemic aspects linked to water management in our country. It accounts for the way in which work by researchers has configured and validated algorithms to quantify water quality and availability in each of its uses. Without minimizing the problems presented by climate change and environmental degradation, the approach in this section highlights the need to incorporate case studies in order to propose similar behaviour patterns in distinct regions of the country and to find possible solutions to this complexity.

Taking into account that the agricultural sector is the main beneficiary of national water reserves, with irrigation units and districts mainly located in arid and semi-arid regions, part II "Water use, availability, and alternative sources" explores distinct facets of water use, including water quality measurements and estimations, contamination processes, use and reuse of

treated wastewaters, and human consumption. Irrigation engineering is also considered, including water supply for agriculture, aiming at greater global efficiency in order to strategically deliver water to both developed and developing regions.

Part III, "Water quality, pollution, and health", addressing this linked group of issues, includes work surrounding the disturbing problems relating to the pollution of surface and groundwater bodies caused by natural and anthropogenic factors. Collaborative researchers present calculations and deductions concerning the processes of contamination at the same time as exploring legal and normative aspects – a domain where our country often lacks effective law-enforcement mechanisms and efficient regulations, leading to terrible sanitary damage.

Part IV, "Social effects, conflicts, and hydrodiplomacy", takes the interrelation between the alarming pace of climate change and water scarcity in some of the country's regions as starting point. Scarcity is exacerbated by rapid demographic growth, and by increasing water demand in the agricultural, industrial, and domestic use sectors. Among other topics, the section tackles issues such as water conflict prevention and hydrodiplomacy; concepts such as water security (and its relation to food and health security); border economics and its impact on hydrological resources; the need for a sustainable culture in the face of complex hydrometeorological emergencies, etc. In sum, the section presents solution-based research, seeking to extend the benefits of quality water resources for all.

"Public policy, economy of water, institutions, and legal aspects" constitutes the fifth and last section. It is fundamental for investigating solutions to all the different water-related problems. Authors examine the history of the public policies of various institutions in order to envisage agreements that include citizens' involvement. Crucial topics are dealt with, including diffuse agricultural pollution and point discharges, as well as the quest for an integral management within existing norms and laws that will take into account demographic growth and the changes our planet is undergoing. The importance of organizing all the actions that contribute towards an improved water use has led to the conclusion that responsibility for water use should be societal, leading to the outlining of a common project.

In synthesis, *Water Resources in Mexico. Scarcity – Degradation – Stress – Conflicts – Management and Policy* encompasses definitions, deficiencies, expectations, observations, and critical thinking surrounding water research in Mexico. As a result of its first years of work, CONACYT's Scientific Network on Water presents an interdisciplinary, inter-institutional, and inter-sectorial analysis of the state of the art of water and water-related topics, at the same time as putting forward a variety of aspects calling for further research in the immediate future.

Water constitutes a great responsibility for us all. Collective participation in order to solve the problems derived from its scarcity, quality, use, management, and pollution is both urgent and essential. Works such as this represent an invaluable effort to raise awareness of a current phenomenon that is permanently subject to change, demonstrating the urgency of continuing to work on solutions for the common good.

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