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## **Editorial**

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### **Ioannis K. Kalavrouziotis\***

School of Science and Technology,  
Hellenic Open University,  
Tsamadou 13-15 and Saint Andrea,  
262 22 Patras, Greece  
Email: [ikalabro@eap.gr](mailto:ikalabro@eap.gr)  
\*Corresponding author

### **Andreas N. Angelakis**

National Agricultural Research Foundation (NAGREF),  
Iraklion Institute,  
71203 Iraklion, Crete, Greece  
Email: [info@a-angelakis.gr](mailto:info@a-angelakis.gr)

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In the long history of humankind the basic, most powerful, propelling force that shaped man's action was the need to secure food and water. All early civilisations had one thing in common; they were located near sources of water such as springs, rivers, lakes or streams. During the Neolithic age (*ca.* 5,700–3,200 BC), the first successful efforts to control water flow were made in Mesopotamia and Egypt by constructing dams and irrigation systems, for the protection of the communities, and for securing water for food needs. The first known effort for water supply and wastewater management was undertaken during the Neolithic Age in El Kowm (or Al Kawm), located between the Euphrates River and the city of Palmyra in contemporary Syria. This location was one of the first places that domestic infrastructure for water and wastewater was built. The early Mesopotamian cities at the end of the 4th millennium BC to the beginning of the 3rd millennium BC had networks of wastewater and stormwater drainage. Some of these cities included Habuba Kebira, Mari, Eshnunna, and Ugarit. Wastewater disposal facilities such as drainage facilities were available in the Late Urak Period (*ca.* 3,300–3,200 BC) at Habuba Kabira.

However, the first successful effort for developing advanced, comfortable, and hygienic lifestyle, as manifested from long-term very efficient water supply and sewerage systems, bathrooms and flushing toilets, were Minoans in the island of Crete (*ca.* 3200–1100 BC) and an unknown civilisation (*ca.* 2600–1900 BC) in Indus valley at Mohenjo-Daro, Harappa, and Lothal. The contacts of Minoans with Egypt intensified from the period of the first palaces (*ca.* 1900–1700 BC) onwards suggesting thus, a possible influx of technology related to water, wastewater, and stormwater management, in this particular era should be existed. In addition, based on the similarities of hydrotechnologies developed by Mesopotamians and Egyptians, Minoans, and Indus valley civilisations possible intercontacts of them should be suggested. These technologies were further improved during the Classical, Hellenistic, and Roman periods as well as during several Chinese Dynasties and Empires and pre-Columbian

civilisations. On the other hand, unsanitary conditions and overcrowding were widespread throughout Europe and Asia during the Middle Ages, resulting periodically in cataclysmic pandemics such as the Plague of Justinian (541–542 AD) and the Black Death (1347–1351 AD), which killed tens of millions of people and radically altered societies.

However, the rapid technological progress in the last century, created a disdain for the past achievements. At the same time, a great deal of unresolved problems, appeared, related to the management principles, such as the decentralisation of the processes, the durability of the water and wastewater projects, the cost effectiveness, and the sustainability and especially the protection from floods and droughts. In the developing world, such problems were intensified in an unprecedented degree. Moreover, new problems have arisen such as the rapidly increasing urbanisation and contamination of water sources. Naturally, intensification of unresolved problems led societies to think of the past and to re-examine the successful past achievements. To their surprise, those who attempted this retrospect, based on archaeological, historical, and technical evidences, they were impressed by two things: the similarity with present ones of principles applied, and the advanced level of management both of water, storm water and wastewater. Thus, today it is well-documented that most of the technological principles related to water and wastewater are not achievements of present-day, but date back to three and four thousand years ago.

In the two volumes of this special issue issues of water, stormwater and wastewater management in ancient civilisations, with the view to underline the contribution of the ancient water technology to the advancement of the contemporary methods of water and wastewater management are mainly presented. Some papers examine modern environmental themes trying to trace old influences. Some other refers to philosophical and scientific, rather than technological, aspects, examining the historical evolution of water sciences. The contributions are basically an attempt of man's continuous and uninterrupted effort to control and efficiently manage the water and wastewater throughout the centuries and to the advancement of human civilisations from its dawn to the present time.

The 12 papers included in this first volume of the special issue, cover a wide spectrum of water and wastewater thematology, which is extended from prehistoric times (including mythology) to the modern times. A number of papers are highlighting the management of urban water supply and wastewater in various ancient civilisations such as Greek, Roman, Chinese, and Mesopotamian. Some other papers are reviewing ancient water systems (such as fountains, harvesting and use of rainwater, and hydraulics of watermills). Another paper is dealing with the categorisation of water structures regarding the collection, transportation and storage processes. The final paper of the first volume is considering geothermal energy and its impact to the environment. Finally, legacies and lessons learned from the past water, wastewater, and stormwater management technologies are considered. These technologies are the underpinning of modern achievements in water and sanitation engineering and it is the best proof that: *the past is the key for the future*.