

Let the new age of water begin



Peter Gleick's book on water tells the story of how society has interacted with water resources and suggests a path for the future that will benefit both humans and the environment.

History books can teach us a great deal about our successes and our mistakes. They can also provide us with significant advice to build our future. To be successful, a history book needs to be informative and it must engage the readership throughout. In his book *The Three Ages of Water*¹, published in June 2023, Peter Gleick manages to achieve such engagement by beautifully balancing his knowledge as a water researcher with his curiosity and fascination with water as a human being. He recounts tales of ancient civilizations and myths, as well as stories from a more recent past, and he builds his proposal for the future, always combining facts with personal experience.

We could define Gleick's three ages as the ancient past, the recent past/present, and the future. It would certainly work but it would also be a bit simplistic. The first age could be more appropriately defined as the age of discovery, when civilizations started learning the power of water. Particularly fascinating is the fact that the myth of the flood, one of the cornerstones of Western religious beliefs, was present in traditions as old as those of the ancient people of Mesopotamia, those of ancient India and those of ancient China, and was adapted by Greek and Latin writers. During the first age, the discovery also meant moving the first steps in learning to use water, giving birth to agriculture and to public sanitation.

After discovery came domination. The second age of water described by Gleick, began when enormous scientific advances meant that water resources could be exploited at a vast scale for economic growth. Dams and canals were built wherever and whenever they could bring about large goods and energy production. Agriculture also expanded to industrial scales, thanks to the improved control of surface water, but also to the increased ability to

conveniently tap into groundwater reservoirs. Sadly, the enormous wealth produced by the extensive use of water resources has also meant catastrophic damage to the environment, when use has become, instead, abuse. On the one hand, the direct release of contaminants into water resources has meant a progressively growing degree of pollution. On the other hand, the construction of large infrastructure like dams, canals, and levees, has resulted in the disruption and often destruction of entire ecosystems.

The attitude of society towards the use of water resources during the first part of the period that Gleick refers to as the second age of water has also been well explained by Giulio Boccaletti in several of his lessons (see for example ref. 2). The priority was economic growth, with little or no concern for the consequences for the environment, let alone the effect of environmental degradation on society itself. We have started realizing however that the same infrastructure we created to dominate water resources does not protect us from a transforming environment, for example, because of climate change. Just to name an example to illustrate this point, the Po Valley was characterized by unprecedented droughts in 2022, with severe consequences, especially for agriculture. The drought was then followed by intense floods in May 2023, with tragic immediate consequences including 15 victims, 40 thousand people displaced and 7 billion Euros spent in damage, plus inestimable long-term effects on the ecosystem of the region, and on the potential agricultural productivity. Straight after the floods in Emilia Romagna, at the beginning of June 2023, another flood of catastrophic proportions occurred due to the destruction of the Kakhovka Dam. A different cause, this time directly related to human intervention during the conflict between Ukraine and Russia – though each country denies responsibility – but similar consequences: tens of victims, tens of thousands of people displaced, huge damage to agriculture and energy production (the dam was primarily used for hydroelectric power generation).

The relationship between water resources and society established in the second age of

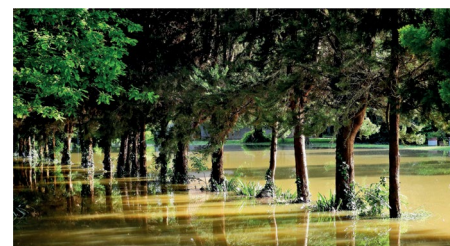


Fig. 1 | City public park. Areas of underwater terrain due to flooding and torrential rain in Emilia-Romagna on 18 May 2023.

water is simply unsustainable. It is time to realize that to prevent the catastrophic consequences of floods, droughts and pollution we must drastically change the way we interact with water in a harmonious way. In the last part of his book, Peter Gleick discusses how this can be achieved by what he calls the 'soft path for water'. The five principles of Gleick's proposal are discussed in the book and partly in his previous work^{3,4} and include a recognition of the human right to water, the protection of the environment and the extension of water resources to include recycled wastewater. Here, we feel the urgency and importance to highlight the necessity of recognizing the true value of water, moving beyond the amount of money that water can generate and including, for example, the benefits of ecosystem health and the interest of generations to come.

To be sure that we avoid reaching a point of no return, the third and new age of water, that of hope, must begin immediately. The good news is that the damage done so far is not irreversible. Citing directly from Peter Gleick's book, "the second age of water is coming to an end, and not a moment too soon."

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