

Water and Rivers of the Future

Joaquim Manuel VELOSO POCAS MARTINS, Ordem dos Engenheiros | WFEO MEMBER, Portugal

Managing our resources (land, water, mining, energy)

Increasing population, poverty and climate change introduce new levels of complexity to water management.

Dry regions are likely to become even drier and nearly half the world population living in water-scarce areas could duplicate by 2050. Many millions of people living close to the sea and the rivers at high risk flood areas may have to be displaced.

In a plausible scenario of duplicating the world population and increasing GDP per capita, much more water will be necessary even where and when nature cannot provide it. There will be pressure to build more dams, artificializing rivers and hydraulic regimes, with high environmental and landscape impacts.

Water will have to be managed much more carefully and new origins have to be mobilized, namely rain water, wastewater reuse and desalination.

Using water more efficiently and pricing it realistically in agriculture, industry and cities will be unavoidable.

Technology and the price of energy will have great impact in terms of the viability of reuse and desalination.

The decreasing of costs of electric batteries and hydrogen will make dams less necessary to store water for energy production. Water stored in reservoirs of hydroelectric systems may become available to other uses, reducing pressure to additional river artificialization.

Domestic water consumption per capita may decrease in the developed world, water loss will have to be drastically reduced from the unacceptably high current figures and we will probably use water of different quality for different uses at home.

Water reuse will probably be rule in cities and industries, closing the urban and industrial water cycles and this will have great positive impact on river pollution water quality.

Water reuse may also be carried out in cities at building and even at individual home scales, altering the ways in which public water supply and wastewater systems will be managed and expanded. Dry toilets may be used in rural and in peri urban areas, where conventional sewerage is not feasible.

Precision agriculture will replace traditional irrigation, and if the energy prices will come down, it may be practiced even at the deserts with desalinated water.

Even in a context of increasing population and climate change, renaturalization of rivers is the most ... natural decision.

There are and for sure there will be engineering solutions to anticipate and respond to change, but the major decisions regarding water will always be political in the future.