IWRM Action Hub

RESOURCE

Valuation of hidden water ecosystem services: the replacement cost of the aquifer system in Central Mexico

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Description / Abstract

This paper reports research estimating the costs of replacing the groundwater that the metropolitan areas of Mexico City, Toluca, and Cuernavaca, in Central Mexico, pump from 10 over-exploited aquifers with 6 supply alternatives of surface water. These aquifers provide about 70% of the water required by more than 28 million people, and their recharge zones in forested areas are increasingly threatened by economic activities. By designing a constrained optimization program that minimizes investment and operation costs, we found that replacing groundwater extraction involves the construction of all six alternatives at an estimated cost of US$25 billion at present values (US$0.6 m^{-3} over a 26-year period). We designed and analyzed a scenario to combine measures to reduce water leaks in Mexico City; a positive balance was found: every dollar invested in leak control reduces replacement costs by between US$1.9 and US$8.4. Therefore, our results suggest the prioritization of leak control measures in order to reduce extraction from over-exploited aquifers. Local authorities should be warned about the economics of losing ecosystem services that are crucial to sustaining the population and the economic activities in the region of study.

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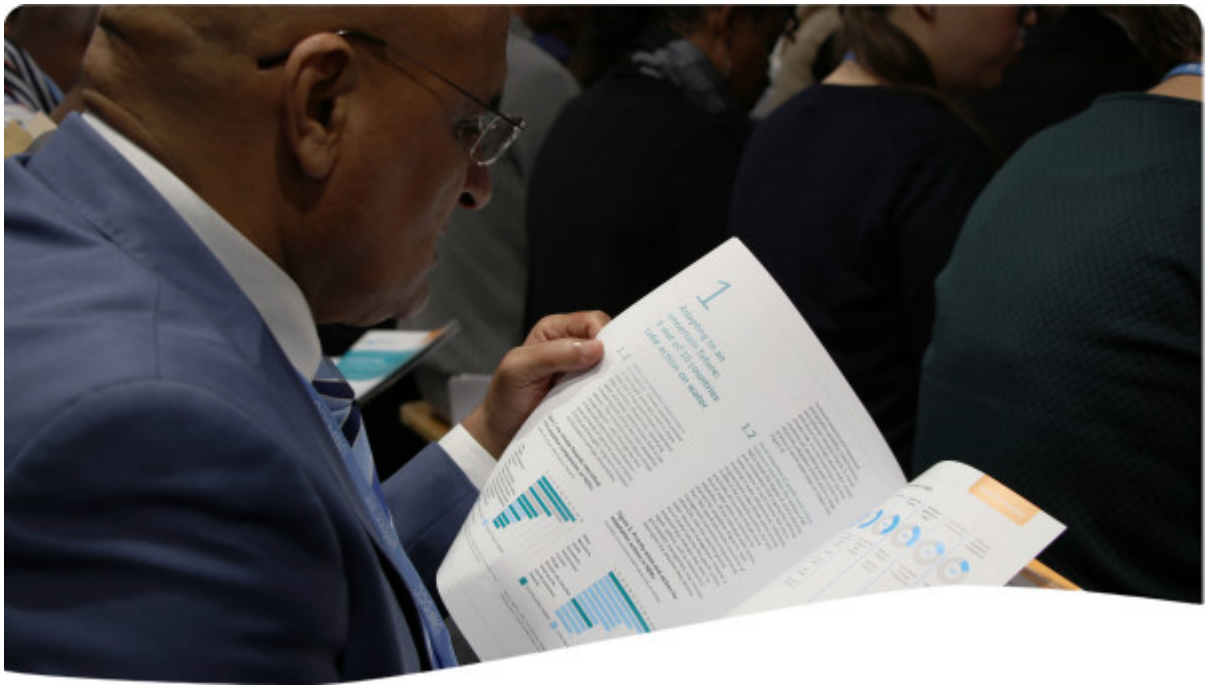
Related IWRM Tools



Tool

Economic Value of Water

D1.02

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