Cities face dramatic increase in water treatment spending when watersheds are developed

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The downtown Dallas, Texas (USA) skyline from a levee along the Trinity River. Facing southeast. Credit: drumguy8800/Wikipedia

A new global study has found that one in three large cities spend 50 percent more on water treatment costs as a result of damage to the ecological quality of their watersheds.

This study found that urban source watershed degradation is widespread globally, with 9 in 10 cities losing significant amounts of natural land cover to agriculture and development in the watersheds that supply their

drinking water. This has led to polluted water and an increase in water treatment costs that represent a liability in excess of $100 billion US (net present value).

"This increase in cost matters because increases in water-treatment costs are paid for by those living in cities, so watershed degradation has had a real cost for hundreds of millions of urbanites," said Rob McDonald, lead scientist for The Nature Conservancy's Global Cities program.

Urban water treatment costs rise when the water quality at the source of a city's drinking water is affected by how the land in the watershed is used. Intact forests and other natural ecosystems protect water quality in a way that farms and residential neighborhoods cannot.

"Estimating watershed degradation over the last century and its impact on water-treatment costs for the world's large cities," was published July 25 in the peer-reviewed journal *Proceedings of the National Academy of Sciences* (*PNAS*), and coauthored by McDonald, his fellow scientists Tim Boucher and Daniel Shemie from The Nature Conservancy and colleagues from Yale and Washington State universities.

As the world grows more urban - with more two-thirds of the world's population expected to live in cities by 2050 - and climate change drives droughts and water shortages, protecting drinking water for city residents will be an increasing challenge for municipal leaders.

This study demonstrates the critical role that nature can play in ensuring clean, safe drinking water with an analysis of new global data about the sources of cities' drinking water and information about population growth and land use change over the period of 1900-2005.

"City leaders can use our findings to advocate for protecting their drinking water from contamination, rather than spending billions of

dollars to clean it up" McDonald said. "Cities can protect their watersheds and avoid treatment cost increases by planning for sustainable development that considers impacts on natural systems."

The Nature Conservancy works with cities and companies globally to protect and restore drinking watersheds via a sustainable strategy known as "water funds." Water funds connect urban residents with the protection of the sources of their drinking water upstream and create the conditions for cities to invest in urban source watersheds.

"For city leaders looking to secure their water supply, water funds offer a mechanism to partner with upstream communities and invest in the rivers, forests and other ecosystems we all depend on for clean water," said Shemie, Strategy Director for The Nature Conservancy Global Water Funds program.

More information: Estimating watershed degradation over the last century and its impact on water-treatment costs for the world's large cities, *PNAS* www.pnas.org/cgi/doi/10.1073/pnas.1605354113

Provided by Washington State University

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