BTO Executive Summary

Use of alternative sources for drinking water requires taking account of entire water system

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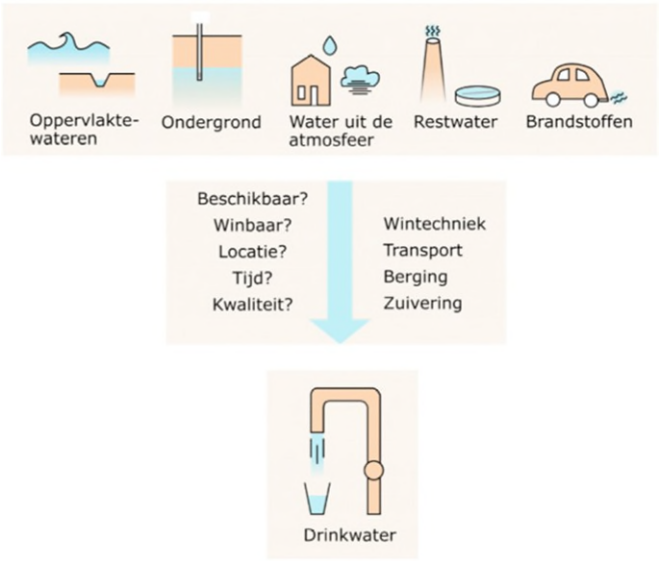
Developments in nature and society will have consequences for the drinking water provision. As a result, options like the use of alternative sources and small-scale treatment processes come into the picture. Which alternative sources can be employed, depends on specific, local conditions. Although small-scale treatment processes are, as a rule, more costly than centralised (drinking) water production, conditions might be such that the implementation of small-scale systems is nonetheless advantageous. Such changes have consequences for the drinking water utilities, the surrounding environment and society. In this process, it is necessary to take into account and weigh all interests in the entire water system. In this, a good collaboration between all stakeholders in the water system is essential.



Each water source could become a drinking water source, but only if it meets key criteria such as availability, recoverability and quality.

Interest: preparation for the future

What impact will future developments have on the drinking water provision? Water utilities are keen to prepare the drinking water provision for the future, but what that future will look like is largely unknown. Exploratory research is therefore focused on getting a better picture of the future. It is clear that the current drinking water sources, groundwater and surface water, are coming under steadily increased pressure. For this reason, it is important to get an idea of the alternative drinking water sources that will be available in the future, the treatment steps that would be required to draw on these alternative drinking water sources, and

the possible consequences of a switch to them for drinking water utilities, society and the surrounding environment.

Approach: scenario study for fictional environment

Three different scenarios were elaborated for a fictional environment (with a city, a village, farms and industry). The first scenario assumes the use of local sources, like rainwater, and maximum water conservation. The second scenario is based on a circular economy, in which WWTP effluent and residual water from the food industry are used as sources. Both these scenarios also involve the treatment of greywater and its reuse as household water. The third scenario takes into account a growing demand for water and major climate change, so that brackish groundwater is used as the most important drinking water source, complemented by residual water from the food industry.

From 29 different alternative sources (originating from surface water, the subsurface, residual water, the atmosphere, or generated by fuel combustion), a selection was made of the most suitable ones based on availability, recoverability and quality. For this selection, different water treatment schemes were formulated and their costs estimated. In addition, the possible consequences of all the different configurations for the drinking water utilities, society and the surrounding environment were described.

Results: various alternative sources available; but good collaboration in the water system required

The research shows that different alternative local sources can be used to produce drinking water. Small-scale treatment processes are generally more costly than centralised drinking water treatment. However, depending on the local conditions, the exploitation of such sources might still be of interest. But this will have implications for drinking water utilities, society and the surrounding environment. In all three scenarios the use of local sources requires good collaboration between all stakeholders in the entire water system. This applies for instance to the application of the necessary technical advances, such as the development of online sensors, legal and regulatory frameworks, and the closing of water cycles, or parts thereof. A robust drinking water provision means that all the different interests must be carefully weighed, and that water systems must consequently be viewed in their entirety.

Implementation: move well-prepared into the future

If the current drinking water sources come under pressure in the future, there are alternative sources available that can technically be used. Switching to these sources will however have consequences for the drinking water utilities. They must therefore accompany these trends and take such changes into consideration in their future planning. Given that all the scenarios studied show that closer collaboration with other stakeholders in the water system is becoming very important, it would be opportune to invest in this collaboration now.

Report

This research is described in the report *VO Radicaal nieuwe bronnen voor drinkwater* (BTO-2019.019).

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