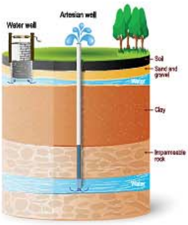
WATER RESOURCES FOR DRINKING WATER TREATMENT AND THEIR POLLUTION

In the Czech Republic

Drinking water in the Czech Republic is obtained from **surface sources** and **underground sources**. The advantages of **underground sources** are **stable water quality** and **very low levels of pollution**. Naturally, it contains a higher concentration of **carbon dioxide** and dissolved metals, especially **iron** and **manganese**. Some underground waters contain higher concentrations of **nitrates** or **radon**. Recently, due to intensive agricultural activity, some of them are contaminated by crop treatment chemicals – **pesticides**. On the other hand, **surface waters** are characterized by **variable quality** and presence of several **natural pollutants** (clay minerals, humic substances, cyanobacteria, and their products) and **anthropogenic pollutants** (micro-pollutants, pesticides).

In the Czech Republic, there are still enough surface and underground water resources. But in some parts of the world, these resources are deficient and therefore other sources must be used to produce drinking water. For example, Israel and Dubai cover most of the **drinking water** consumption **by desalination of seawater**. In Singapore and Namibia, it is necessary to **recycle wastewater** and use it **for the production of drinking water**.



Besides **the lack of water** which is enhanced by **climate change** in many places, there is a serious problem with **water quality**. Because of human activities, we can find plenty of harmful substances in many water sources, such as **pesticides, persistent organic pollutants, as well as residues of pharmaceuticals, personal care products, or micro-plastics**. However, the world's most important problem is undoubtedly the **eutrophication** (increase in nutrients, especially nitrogen and phosphorus), which, together with climate change (temperature rise, increasing vegetation time, etc.), lead to the proliferation of **cyanobacteria** in water sources. Cyanobacteria produce many substances that make the water difficult or even impossible to be treated for drinking water. This problem is becoming increasingly important and due to climatic change, it threatens also the sources of drinking water in the Czech Republic.

This is what drinking water sources might look like

Waste water recycling, project NEWater - Singapore

In 2018,
625.1 million m³ of raw water was taken for drinking water production in the Czech Republic in total. Out of this volume, 326 million m³ was taken from surface sources and 299.1 million m³ from underground sources.

In the Czech Republic, about 51%
of drinking water originates from surface sources and 49% from underground sources. For example, in Denmark, drinking water is supplied almost only from underground sources, and in Germany, it is 72%. On the other hand, in the United Sates, 77% of drinking water is from surface sources.

Water supply, Vltava river in the Czech Republic

Worldwide, at least 2 billion people
use a source of drinking water contaminated by faecal pollution. Denmark, Iceland, Greenland, and Finland are among the countries with the cleanest sources of drinking water on Earth. At the other end is Mexico. Due to this fact, almost three-quarters of people in Mexico are forced to drink bottled water. This country is a world leader in bottled water consumption.

Brazil, Russia and the United States
have the biggest freshwater reserves in the world. Brazil alone has more than 12% of the total world's freshwater reserves. Lake Baikal, the largest and deepest freshwater lake in the world, represents approximately 1/5 of all freshwater in the world.

The largest reservoir in the Czech Republic
is, based on the volume of water, Orlík with 716.5 million m³ (area 27.31 km²); and based on the area, Lipno with 48.7 km² (309.5 million m³).

Plastics and microplastics in water

Cyanobacteria in the Švihov water reservoir

VODA