

Every sixth person lacks access to safe drinking water today and the situation is predicted to deteriorate. Population, pollution and climate put the squeeze on potable supplies making water a priority on political and corporate agendas.

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On a water watchout

OF ALL THE FRESHWATER on the planet, less than 1 percent is available to mankind. The rest is tied up in glaciers and polar ice or in groundwater so far below surface that it is not possible to extract. "The problem is that the water is not at the right place at the right time," says Håkan Tropp, project director at the UNDP Water Governance Facility at the Stockholm International Water Institute.

Roughly 70 percent of the world's freshwater used goes for agricultural use. Industry uses 20 percent and households use the remaining 10 percent. Meanwhile, highly industrialized nations tend to use more water per capita than developing ones.

The United Nations estimates that every sixth person (1.1 billion people) faces inadequate access to safe drinking water. By 2025, according to UN projections, water shortages will affect 2.3 billion people in about 50 of the world's 200 nations.

Population and economic growth across Asia and the rest of the developing world is a major factor driving fresh-water scarcity. The earth's human population is predicted to rise from 6 billion to about 9 billion by 2050, the UN reports. Feeding them will mean more irrigation for

crops. Meanwhile, global warming could disrupt water flow patterns, further reducing the availability of drinking water.

"We are in a situation where we need to protect our water sources in order to secure clean freshwater in the future," says Arjen Hoekstra, professor in Multidisciplinary Water Management at the University of Twente in the Netherlands and author of several books on water policy. "The pace of change is slow. There has been an attitude change in recent years, and water is becoming an issue on the political arena and in industry. Still, there is a lot of room for improvement."

BUT THE ISSUE IS complex, and one main obstacle is money. Says Tropp: "To a large extent, the water crisis is an agricultural crisis. In agriculture, more efficient irrigation systems could do a tremendous deal, and the technology is there. The question is, who is going to pay for it?"

Another problem, he notes, is that in most instances

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the price on water is too low and is often subsidized by states. This means that there has been little economic incentive, even on the part of industry, to save on water. However, reducing water usage through efficiency measures and reuse will become increasingly important as supplies decrease.

"All industries produce wastewater," says Ivar Madsen, business unit manager, Energy and Environment at Alfa Laval in Copenhagen. "Some use municipal water treatment facilities to clean it, while others use their own wastewater treatment plants. One trend we are seeing is that wastewater is beginning to be viewed as a resource, particularly in

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Håkan Tropp, projekt director UNDP.



How much water does it take?

1 cup of coffee – 140 litres of water

1 litre of milk – 1,000 litres

1 kilogram of wheat – 1,300 litres

1 kilogram of rice – 2,300 litres

1 kilogram of beef – 16,000 litres

SOURCE: *Globalization of Water*, Hoekstra and Chapagain, 2008, Blackwell Publishing

>>> dry nations of the Middle East and around the Mediterranean.”

Water treatment technology can be used to clean wastewater so that it can be used for irrigation or cleaning purposes. In fact, water treatment technology is now so advanced that wastewater can be cleaned and reused as potable water. In Singapore, as much as 10 percent of the tap water stems from reused water. Another way to tackle freshwater scarcity is through desalination – turning seawater into freshwater. This is an expensive option, but one that is feasible in coastal areas.



Arjen Hoekstra, professor in Multidisciplinary Water Management.

BOTH HOEKSTRA AND TROPP see water as the next corporate green trend. Environmental thinking has already made its way into the boardrooms and corporate social responsibility is becoming an important tool for companies when it comes to attracting consumers as well as investors.

To talk about water use, Hoekstra has coined the term “water footprint,” a concept that can be applied to nations, corporations or products.

“Companies have an operational water footprint, which basically is the water used in production,” says Hoekstra. “But the business water footprint looks at the whole process

and traces the water used through the supply chain. Take cola as an example. There is the water used by the company needed to make the beverage. But manufacturing cola also requires sugar, which is a highly water-intensive product, and a bottle [whose production process also requires water], so in the end, the product uses much more water than one might anticipate.”

Corporate water footprinting is a relatively new tool, but pilot studies are under way, primarily in the food and beverage industry. This autumn, Borealis, a maker of plastics solutions, and Uponor, a supplier of plumbing and heating systems, announced plans for a joint initiative to pilot the concept of water footprinting to the plastics industry.

Corporate water footprinting offers a way to measure water use and also provides an easy way for consumers to grasp the water involved in the manufacture of a product. It takes, for example, 16,000 litres of water to produce one kilogram of beef, or 10 times more than the water needed to produce a kilogram of rice.

“Companies today are dealing with climate issues and energy issues,” says Hoekstra. “Water issues are likely to become the next big thing.” ■

► Key technologies for water recycling

An imminent challenge

– Alfa Laval’s solutions tackle the water scarcity

Alfa Laval has been at the forefront when it comes to developing solutions and processes for treating water and maximizing water reuse.

Its key technologies are in such areas as cleaning of wastewater and reduction of sludge volumes, recycling of effluents, desalination of seawater, and cleaning of ballast and bilge water onboard ships. Ivar Madsen, business unit manager, Energy and Environment at Alfa Laval Copenhagen, says a big trend now is water reuse.

“In the food industry, which is one of our major customer segments and one with extremely high demands on pure water and technology,

there are moves to reuse water,” he says. “It may not go back into production, but it can be used, for example, for cleaning purposes.”

Alfa Laval offers several solutions to tackle water scarcity and water reuse. Producing water by desalination is a very energy-intensive method. Alfa Laval’s waste-heat-driven plate-based distillation evaporators use waste heat at, for example, power stations to produce drinking water.

In addition, the company offers a combination of high-speed separators, decanters, membranes and plate evaporators that reuse water before it “becomes” wastewater,

“In the food industry there are moves to reuse water. It may not go back into production, but it can be used, for example, for cleaning purposes.”

thereby reducing overall water consumption.

Further downstream in the wastewater process, membranes in bioreactors provide an opportunity to reuse wastewater for irrigation and cleaning. Wastewater sludge volume is reduced with decanters and drum



Ivar Madsen, manager, Alfa Laval.

thickeners, thus reducing transport and disposal costs. Madsen says that a future challenge lies in optimizing the solutions to obtain even more energy-efficient processes.

“That is one of the biggest challenges right now,” he says. “And we are constantly working to improve our technology to accomplish this.” ■