Israel solves water woes with desalination

May 30 2014, by Josef Federman

In this Sunday, May 4, 2014 photo, workers climb stairs at the Sorek desalination plant in Rishon Letzion, Israel. Israel's aggressive desalination program that has transformed this perennially parched country into perhaps the most well-hydrated country in the region. (AP Photo/Dan Balilty)

After experiencing its driest winter on record, Israel is responding as never before—by doing nothing.

While previous droughts have been accompanied by impassioned public service advertisements to conserve, this time around it has been greeted

with a shrug—thanks in large part to an aggressive desalination program that has transformed this perennially parched land into perhaps the most well-hydrated country in the region.

"We have all the water we need, even in the year which was the worst year ever regarding precipitation," said Avraham Tenne, head of the desalination division of Israel's Water Authority. "This is a huge revolution."

By solving its water woes, Israel has created the possibility of transforming the region in ways that were unthinkable just a few years ago. But reliance on this technology also carries some risks, including the danger of leaving a key element of the country's infrastructure vulnerable to attack.

Situated in the heart of the Middle East, Israel is in one of the driest regions on earth, traditionally relying on a short, rainy season each winter to replenish its limited supplies. But rainfall only covers about half of Israel's water needs, and this past winter, that amount was far less.

According to the Israeli Meteorological Service, northern Israel, which usually gets the heaviest rainfalls, received just 50 to 60 percent of the annual average.

Tenne said the country has managed to close its water gap through a mixture of conservation efforts, advances that allow nearly 90 percent of wastewater to be recycled for agricultural use and, in recent years, the construction of desalination plants.

Since 2005, Israel has opened four desalination plants, with a fifth set to go online later this year. Roughly 35 percent of Israel's drinking-quality water now comes from desalination. That number is expected to exceed 40 percent by next year and hit 70 percent in 2050.

The Sorek desalination plant, located roughly 15 kilometers (10 miles) south of Tel Aviv, provides a glimpse of that future.

With a loud humming sound, the massive complex produces roughly 20 percent of Israel's municipal water, sucking in seawater from the nearby Mediterranean through a pair of 2.5-meter-wide pipes, filtering it through advanced "membranes" that remove the salt, and churning out clean drinking water. A salty discharge, or brine, gets pumped back into the sea, where it is quickly absorbed. The facility, stretching nearly six football fields in length, opened late last year.

This Sunday, May 4, 2014 photo, shows Sorek desalination plant in Rishon Letzion, Israel. Israel's aggressive desalination program that has transformed this perennially parched country into perhaps the most well-hydrated country in the region.. (AP Photo/Dan Balilty)

Avshalom Felber, chief executive of IDE Technologies, the plant's operator, said Sorek is the "largest and most advanced" of its kind in the world, producing 624,000 cubic meters of potable water each day. He said the production cost is among the world's lowest, meaning it could provide a typical family's water needs for about $300 to $500 a year.

"Basically this desalination, as a drought-proof solution, has proven itself for Israel," he said. "Israel has become ... water independent, let's say, since it launched this program of desalination plants."

By meeting its water needs, Israel can focus on longer-term agricultural, industrial and urban planning, he added.

Disputes over water have in the past sparked war, and finding a formula for dividing shared water resources has been one of the "core" issues in Israeli-Palestinian peace talks.

Jack Gilron, a desalination expert at Ben-Gurion University, said Israel should now use its expertise to solve regional water problems. "In the end, by everybody having enough water, we take away one unnecessary reason that there should be conflict," he said.

This Sunday, May 4, 2014 photo shows the Sorek desalination plant in Rishon Letzion, Israel. Israel's aggressive desalination program that has transformed this perennially parched country into perhaps the most well-hydrated country in the region. (AP Photo/Dan Balilty)

Israel has already taken some small steps in that direction. Last year, it signed an agreement to construct a shared desalination plant in Jordan and sell additional water to the Palestinians.

Israel's advances with desalination could help it provide additional water to the parched West Bank, either through transfers of treated water or by revising existing arrangements to give the Palestinians a larger share of shared natural sources.

"Desalination, combined with Israel's leadership in wastewater reuse, presents political opportunities that were not available even five years ago," said Gidon Bromberg, the Israel director of Friends of the Earth

Middle East, an environmental advocacy group.

Under interim peace accords signed two decades ago, Israel controls 80 percent of shared resources, while Palestinians get just 20 percent. A more equitable deal could remove a key source of tension, opening the way for addressing other issues, he said.

But with the most recent round of peace talks having collapsed last month, there is little hope of making progress on any of the core issues anytime soon.

Moreover, Bromberg said desalination is not an end-all solution. The plants require immense amounts of energy, consuming roughly 10 percent of Israel's total electricity production, he said.

The exact impact of desalination plants on the wider Mediterranean also isn't clear, he added. A number of countries, including Cyprus, Lebanon and Egypt, are either using or considering the use of desalination plants.

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IDE's Felber said the impact of returning brine to the sea is "minor." But Bromberg insists it is too early to say what impact multiple plants would have, saying "much more research is required."

Relying so heavily on desalination also creates a potential security risk. Missile strikes or other threats could potentially knock out large portions of the country's water supply.

The threat is even more acute in Arab countries of the Gulf, which rely on desalination for more than 90 percent of their water supplies and are located much closer to rival Iran.

The Sorek plant is heavily protected with fences, security cameras and guards, and it is not connected to the Internet, instead using a private server, to prevent cyber attacks. But like other key infrastructure, it could be susceptible to missile strikes. During a 2006 war, for instance, Lebanese Hezbollah militants attempted to strike an Israeli power plant.

Tenne, of the Water Authority, acknowledged that "anything in Israel is vulnerable," but said the same could be said for sensitive infrastructure behind enemy lines. "I hope that people will be smart enough not to harm infrastructure," he said.