Water politics must adapt to a warming world

As rainfall patterns shift, technological and legislative changes are needed to address water shortages, says Moshe Alamaro.

The world has just experienced the hottest August since records began, and 2014 is shaping up to be one of the warmest years. What will happen to our rainfall as the globe continues to heat up? In theory, a warmer atmosphere should lead to increased ocean evaporation that, in turn, would bring increased precipitation. In practice, many countries have experienced severe drought in recent years — a problem that Brazil and the southwestern United States are currently facing.

Where is the rain? It could be that climate change alters global atmospheric circulation, which leads to increased variability in precipitation. If rainfall patterns are changing, then policies and strategies to conserve water on the ground must shift as well. Long-term planning must change. Attitudes to water must mature. This is not the present situation. Instead, in response to drought we have a series of seemingly futile measures that are best described as a political placebo.

China and several US states, for instance, try to encourage rain by seeding clouds with chemicals launched from aircraft or large guns, despite widespread scepticism about the effectiveness of such measures. And for the past two months in Wichita Falls, Texas, 5 tonnes of a palm oil and limestone powder have been dumped every two days into a 57-square-kilometre reservoir that has shrunk to one-fifth of its capacity because of the drought. The palm oil creates a thin film on the water surface and is claimed to reduce evaporation by 10–30%. But even if it works, a 10% reduction of evaporation is less than the natural year-to-year variability of evaporation due to climate fluctuation. California aims to reduce residential water consumption by 20% through implementing fines on wastage. But residential water use is less than 15% of the total demand, with the rest used mainly for agriculture. Thus a 20% reduction in residential demand will amount to less than 3% of total demand — a mere drop in the bucket.

These measures are the placebo. Governments are compelled to conduct visible (and sometimes noisy, as in the case of cloud-shooting in China) measures to convince their citizens that something is being done — just as police are instructed to use sirens when they drive, to assure people that crime is being fought.

There are better solutions to water shortages. But they will require technological, policy and legislative changes that governments seem unwilling or unable to make. The reality is that there is simply not enough fresh water for everybody to use as much as they want, whenever they want. It makes little sense, for example, to continue to grant ownership — and unlimited use — of underground water to whoever owns the land where the water

is pumped to the surface. Still, at least selling and buying underground water is subject, more or less, to market forces. Surface water from rivers, lakes and reservoirs presents a much more complicated problem.

Water policy is based on voodoo economics — the cost, value and price of water are notoriously difficult to pin down. To an economist, the 'cost' of a litre of surface water in California or Texas is close to zero. Why? Because the reservoirs, dams and aqueducts were built between 50 and 100 years ago, and the investment has long since depreciated.

The 'value' of water is more flexible. In times of drought, governments might cut supply and compensate farmers for the loss of a single growing season. Yet to an almond or olive farmer, the value of one year's water is higher because to grow such a tree takes several seasons. Farmers are therefore willing to pay much more for water during drought.

The 'price' of water, however, is unlike that of most other commodities. Water is not traded between countries — its prices are highly political and subsidized according to the influence of various interest groups. The Santa Clara Valley Water District in San Jose, California, for example, charges US\$40 per acre-foot (about 1.2 million litres) for water for agricultural purposes, and more than \$600 per acre-foot for other industrial applications.

The United States needs a more rational water sector. As climate change continues, it makes little sense, for example, to use heavily subsidized water supplies to grow rice in California or Texas when the crop could be imported from water-rich countries in southeast Asia. (The excessive water, incidentally, is needed not to grow the rice but to suppress weeds.)

To address water shortages, Texas plans to develop new reservoirs. The depreciated cost of construction per acre-foot is more than \$600. This is about the same cost as of desalination. Water-industry reform would open the door to alternative technologies — desalination included — that cannot compete in currently distorted markets. For the United States and others to encourage innovation and ensure access to fresh water, the old system of subsidies must be reformed.

In the second half of the last century, new regulations drastically changed the telecommunications and electricity industries in the United States and elsewhere. This success could be transferred to the water sector worldwide, starting now with federal-guided reforms in drought-stricken California and Texas. ■

Moshe Alamaro is a research affiliate in the Department of Earth, Atmospheric, and Planetary Sciences at the Massachusetts Institute of Technology in Cambridge, and chief technology officer of More Aqua, which works on evaporation suppression.
e-mail: alamaro@mit.edu

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